Appraising Public Value in the Public Sector: Re-evaluation of the Strategic Triangle

Malang B.S. Bojang ID[1]*

[1] Faculty of Economics and Administrative Sciences, Political Science and Public Administration Department, Umuttepe Campus, Kocaeli, Turkey
* Corresponding author: malangbsbojang@gmail.com

How to cite?
Bojang, M. B. S. (2021). Appraising Public Value in the Public Sector: Re-Evaluation of the Strategic Triangle. SEISENSE Journal of Management, 4(2), 1-10. doi: 10.33215/sjom.v4i2.551

Purpose- This article aims to address public value by assessing public programs and services' success in a more cost-effective way. The study also investigates how public managers and elected officials can use public value to guide their decisions on resource allocation to create value for the citizens.

Design/methodology- To meet this study's aims, Mark Moore's strategic triangle is used as the framework for this study. This is a comprehensive framework that evaluates the performance of public sector programs and service delivery. Data for this study has been collected via a primary scoping of the literature on public value. Database searches were conducted in the Social Sciences Index, SCOPUS journals, ISI Social Sciences Citation Index, and Google Scholar.

Findings- From the investigation, the result indicates that public value is created by government or public managers in their daily transactions and by non-profit organizations that articulate their objectives and find popular support for the community's common good.

Practical implications- Arguably, public value management provides a necessary improvement to public management theories. It redefines the function of public sector managers in the provision of socially desirable outcomes through citizen engagement. As a progress appraisal tool in public organizations, it offers a broader and inclusive framework than the New Public Management (NPM).

Originality/value- This study's results contribute to the knowledge and literature of public value in the public sector. The strategic triangle builds on the challenges and weaknesses of NPM and it aims at reshaping institutions to prioritize value creation for citizens.

Introduction

Professor Mark H. Moore has initiated research on the way managers in the public sector can involve communities in assisting and legitimizing their work in public sector organizations. In his book title, 'Creating Public Value,' Moore (1995) describes public value equivalent to private sector organizations' private value. The only difference he argued was that while the private sector aims to maximize profit (shareholder value), public organizations act in the community's best interests (public value). The assumption that benefits are distributed equally in the public sector and public responsibilities sanctioned is as significant as the attainment of socially desirable outcomes or individual satisfaction (EY Report, 2014). Public value creation is structured to get managers thinking about what programs and services are most treasured to society cost-effectively. It is a means of improving quality decision-making through public managers' engagement with the citizens and users of the public services, thus encouraging trust in public sector organizations (Moore, 1995; EY Report, 2014).

Public value as an emerging paradigm is gradually an omnipresent concept in public management discourse and has been highlighted in public sector development programs (Williams & Shearer, 2011). Several scholars have claimed that public value provides a broader measurement perspective than the classical bureaucratic machinery and New Pubic Management (NPM) (Benington, 2009; Bonina & Cordella, 2008; Moore, 1995; Stoker, 2006). It has been signaled as a 'third way' beyond classical public management and NPM. This is because it focuses on many of the modern-day challenges public institutions faced in the public sector. Fair distribution of resources, authorize decision-making, and performance measurement are some of these challenges (Hills & Sullivan, 2008). Public value provides a comprehensive tool to measure inputs and outcomes of public programs and services in an authorized manner. Kelly et al., (2002) define these multifaceted assessment requirements in their Cabinet Office paper as:

> *"… as contemporary and wider appraisal tool within the NPM literature, covering not only socially desirable outcomes but also the means used as well as trust and legitimacy. It focuses on issues such as equity, ethos, and accountability" (Kelly et al., 2002).*

This indicates that value in the public sector epitomizes an all-inclusive concept of public management and programs. It seeks to appraise a broader diversity of issues than other methods and that procedures are as vital as social outcomes. To this end, this research aims to address the public value approach to assessing the success of public programs and services in a more cost-effective way. The study also investigates how public managers and elected officials can use public value to guide their decision on resource allocation to create value for the citizens. Therefore, this article seeks to answer the following questions: Is public value a useful performance tool to gauge public services and programs? Who has the legitimate authority to create public value in a democratic society? How can the strategic triangle be used as a guide to gauge the performance of government programs and actions? To meet this paper's purposes and sufficiently answer the research questions, the strategic triangle is employed as the research framework. This is a comprehensive framework to evaluate public sector programs and service delivery (Alford & O'Flynn, 2009; Bojang, 2020; Kelly et al., 2002; O'Flynn, 2007). The paper is organized into three-folds. The first section sets out the principles, practices, and premises of public value creation and measurement in the public sector. This is followed by a brief discussion on the research methodology. The final section re-examined the strategic triangle, which serves as a guide for public sector managers

Literature Review

The Public Value Creation in the Public Sector

The concept of public value has seen a tremendous interest in academia and practitioners alike recently. Ever since Moore's (1995) influential contribution, the idea of public value management offers an inspirational viewpoint on the function of the government (Benington, 2009; Moore, 1995) and a productive substitute area of study to better comprehend public institutions (Cordella & Bonina, 2012). Despite the growing acceptance of public value, yet it lacks a universally accepted definition. This is due to the normativity and variability of contending understandings of the term 'public value'; its meaning and applications are vigorously contested (Jørgensen & Bozeman, 2007; Stoker, 2006; Williams & Shearer, 2011). This ambiguous nature of public value-led several advocates to argue that it ought to be perceived as a paradigm (Benington, 2009; Stoker, 2006), as a concept (Kelly et al., 2002), a model (O'Flynn, 2007). Rhodes & Wanna (2007) strongly criticized public value vagueness, which they believe energies its approval because 'it is all things to all people.' On this background, public value is those "normative agreement about (a) the rights, benefits, and privileges that every citizen ought to be entitled; (b) the responsibilities of citizens to their society, government and to each other; and (c) the values on which government policies ought to be based on" (Bozeman 2007:13). This conceptualization of public value is much broader and incorporates private and public activity (Mazzucato & Ryan-Collins, 2019).

Moore's initial work revolves around three subjects. The function of administration in society, the responsibility of public sector managers in government, and the strategies employed by them to create the most valuable for the society (Cordella & Bonina, 2012). The public value paradigm argues for a fundamental change in the public institutions as it conveys government programs at the center and seeks solutions to meet citizens' expectations. A public sector aiming for value creation should focus on performance management practices by providing a fair and equitable society. According to Stoker (2006), politics is very significant in performance management practice. It influences the foundation for co-operation by changing people's preferences and generating an environment where partnership is possible. For Stoker, it is precisely politics that energies the procedure of value creation in the public sector. Therefore, the political process cannot be disentangled from public management practices.

Similarly, the study by Moore (1995) acknowledges this by stating that "managers ought to be understood as explorers who aims to discover, describe and create public value" (Moore, 1995:21). Moore (1995) suggests managers in the public sphere replace politicians, and be involved in the partisan process, to be the new platonic guardians and judges of the common good. This approach of public value creation is what Rhodes & Wanna (2007) criticize.

Public value stresses the critical role play by the public managers to mediate the necessity for well-organized service provision and citizens' participation in designing public policies (Mazzucato & Ryan-Collins, 2019). Accordingly, public value goals can only be realized via a partnership between private and public sectors, which together, through the procedure of innovation, co-produce, and co-shape markets (Mazzucato 2016). In essence, public value creation strategies ought to go beyond borrowing simple private sector models and market practices. Instead, public sector managers have to consider three issues simultaneously: legitimacy and support, operational capabilities, and public value (Moore, 1995). Kelly et al. (2002) advanced a detailed conception of value source as services, outcomes, and trust. These three-value sources are all significant in public value creation. Trust is the most important because even if the government provides or meets citizens' expectations, a mere lack of trust will destroy public value. Public value gives relative importance to value-laden outcomes and citizens' engagement in the democratic process (Blaug et al., 2006). Public value is profoundly democratic because it requires public sector organizations to discuss value creation in the public sector.

Using government resources to produce public value or public good for society is inspiring because it concentrates on the collective. The public value paradigm contends that an individual's perceptions and preferences cannot be aggregated into what society wants from the government. Through their elected officials, collective citizens decide what they value, and these shared preferences echo what is treasured when the government's policy is concerned. Therefore, the public value cannot be well-defined by the producers but rather by the collective 'WE' (citizens) that consume it (Alford & Hughes, 2008; Cordella & Bonina, 2012). Unlike private values that seek to fulfill individual desires, public values satisfy not just ends but also achieving social outcomes for collective 'We.' In public value creation, the objective of public services should be spell-out, together with the participation of the public in the process of determining what is valuable for the citizens. For instance, appraising how effective and efficient we are using government resources depends on defining public value (EY Report, 2014). The public value approach suggests us to distinguish between means use in public value creation and the ends we seek to attain. What is vital in public value approaches is what works to create social outcomes and satisfy citizens. There is no single right way, but there is a suitable outcome.

The idea of public sector value as argue by Moore (1995) is that the central role of public managers are to scout for prospects of value creation just as private sector executive does. The creation of public value is defined by the action of what government officials do and how they do it (Alford & O'Flynn, 2009; Moore, 1995; Stoker, 2006). The study by Meynhardt (2009) took a psychological account to comprehend the whole idea of public sector value. From the basis of needs theory, Meynhardt (2009) proposes four essential elements related to the public value landscape: "subject, object, basis of evaluation, and character of evaluation" (Meynhardt, 2009:200). This link with Moore's (1995) assumption that public value is rooted in an individual's desires. For Meynhardt (2009), "public value starts and ends with the individual." To put it more clearly, value creation in the public sector is about how people think and feel about society.

There has been extensive evidence in the literature that value is produced by government organizations and non-profit organizations (Alford & Hughes, 2008; Bojang, 2020; Bozeman, 2019; Jørgensen & Bozeman, 2007; Meynhardt, 2009), as seen in the conclusion of Jørgensen & Bozeman (2007) that "public value is not governmental" (Jørgensen & Bozeman, 2007:372). This researcher also shares the same opinion that public value cannot be restricted to a government institution. Still, the private and social sectors do also contribute to public value creation. More emphasis should be on who consumes public value and not who produces it (Alford & Hughes, 2008). As Moore argues, what the citizens' value collectively is the public value (Moore, 1995). Equally, it is not enough for public sector organizations to create what is valuable to the citizenry; the desirable results must outweigh the cost involved. "Only then can we be sure that some public value has been created" (Moore, 1995:29).

Measuring Public Sector Performance

The public value approach seeks to reformulate classical public management and NPM within public administration discourse (Turkel & Turkel, 2016). An indication that public management scholarship is moving beyond the old management system and NPM towards the public value paradigm meets contemporary challenges of public policies (Benington, 2009; Bojang, 2020; Moore, 1995; O'Flynn, 2007). From the challenges and experiences of NPM in the 1990s, there has been an ideological shift from market practices to government. The 'post-competitive' approach focuses on outcomes and efficiency for attaining broader governmental goals (O'Flynn, 2007). Public value gives a more accurate viewpoint for contemporary institutional challenges than NPM approaches (Meynhardt, 2009). Similarly, Jørgensen & Bozeman concluded that public value is the most significant concept in administration discourse and policy studies (Jørgensen & Bozeman, 2007:355). For Alford & Hughes (2008), 'public value pragmatism' is the next public management movement.

Conventional performance measurement tool like NPM draws more on the narrow economic model than public value provides. As a means of appraising progress in the public sector, the public value provides a much broader perspective (Bojang, 2020; Kelly et al., 2002; Stoker, 2006; Talbot, 2017). It is a benchmark used to evaluate development and progress in public organizations, their decision-making process, and the distribution of available resources for effective delivery of services (O'Flynn, 2007). For Mazzucato & Ryan-Collins (2019), public value is a way of assessing advancement towards attaining broader societal goals. In a similar vein, public value puts the public first through citizens' engagement and civic discovery of public interest. Democratic process and public discussion are the currency of the public sector's value cycle (Mazzucato & Ryan-Collins, 2019). Public sector managers, civic participation, and democratic deliberation provide a useful tool for acceptable public policy and value creation (Sandfort and Quick, 2015).

Public value is not only created by the government through services, laws, and regulations (Kelly et al., 2002) but is also determined by perceptions and preferences of citizens, articulated over a plethora of ways (Mazzucato & Ryan-Collins, 2019). This implies that public sector organization can maintain their performance by satisfying citizens via public value (Yotawut, 2018). Public value is an appraisal tool that intensifies the idea of public services. It requires public sector managers to consider cost in service provision and the impact of government activities on the civic life of citizens. As a measurement tool, it focuses on the net benefit of government programs and services. The literature on public value centers on those values that ought to guide public officials, policies, and organizations (van der Wal & van Hout, 2009). Moore emphasizes that public value is a set of measurements used to evaluate the performance of public programs. Therefore, government programs and services can be measured using the concept of public value (Moore, 1995; Rutgers & Overeem, 2014). According to Nabatchi (2018), from the state's perspective, "public sector value describes an assessment of what is produced and continued by the government for the public." Arguably, public value by far provides a modest instrument over public interest as a diagnostic device (Bozeman, 2019; Fukumoto & Bozeman, 2019).

Several scholars have argued that public value provides a more inclusive framework to gauge public programs and services, especially from the citizen's standpoint (Alford & O'Flynn, 2009; Kelly et al., 2002; Talbot, 2017). The framework of public value can be used to justify the use of public resources and at the same time offers practical guidance to public sector managers. It replaces consumers as used in NPM to citizens and policy decision-making backed by the democratic political process. As Mazzucato & Ryan-Collins (2019) asserted, 'it reconcile the long-standing tension between bureaucracy and democracy.' Public managers ought to innovate and enhance services to the public and at the same time improve the value of their service delivery to the public (Rhodes & Wanna, 2007). However, the public management framework's implication as a performance management tool is that the community must be an active contributor in the assessment to be successful. Again, public value measurement is complicated because value creation occurs at the end of the value cycle; perhaps people's lives improve after many years the policy was enacted (Mazzucato & Ryan-Collins, 2019).

Putting public value at the forefront of performance measurement presents a broader benefit of governmental activities. Speaking more broadly, the concept replaces NPM to redefined the function of public managers and reshaped the function of public administration institutions (Ćwiklicki, 2016; O'Flynn, 2007; Spano, 2009; Stoker, 2006). In present-day public administration, it is not enough to deliver social outcomes. Achieving institutional trust and legitimacy is tremendously essential in public administration (Ćwiklicki, 2016). This is in conjunction with Moore's proposition, which focuses more on public management quality and less value.

Methodology
This paper aims to address the public value approach to assessing public programs' success in a more cost-effective way. The study also investigates how public managers and elected officials can use public value to guide their decision on resource allocation to create value for the citizens. Therefore, this article seeks to answer

the following questions: Is public value a useful performance tool to gauge public services and programs? Who has the legitimate authority to create public value in a democratic society? How can the strategic triangle be used as a guide to gauge the performance of government programs and actions? To meet the purposes of this study and sufficiently answer the research questions, the strategic triangle developed by Moore (1995) is employed as a framework for this study. This is a comprehensive framework to evaluate public sector programs and service delivery (Alford & O'Flynn, 2009; Bojang, 2020; Kelly et al., 2002; O'Flynn, 2007). According to Moore's strategic framework, public sector managers must be skillful in organizing market activity to create the anticipated value—i.e., they must balance: Valuable vs. Authorizable vs. Doable (EY Report, 2014). The three-dimensional strategic framework developed by Moore (1995) is discussed in detail below.

Data for this study has been collected via a primary scoping of the literature on public value. Database searches were conducted in the Social Sciences Index, SCOPUS journals, ISI Social Sciences Citation Index, and Google Scholar. They were employing and searching the terms 'public value', 'public value management,' 'performance management,' and 'public sector management' in conjunction. Research articles, policy documents, and working papers were selected from in-depth searching.

Strategic Triangle in Public Sector Organization

The underlined assumption of public value theory is that public managers should find opportunities to create what the society most value, just like shareholder value created by the private sector executive (Moore, 1995). Public value is an innovative way of thinking about public administration on how to improve public service. It is a way of understanding what the 'public' values (Moore, 1995). Public sector managers should act and think strategically to produce public value for individuals and collectively for society. This value is delivered via delivering public services to the citizens (Bonina & Cordella, 2008; Moore, 1995). Public value is management thinking that focuses not only on efficiency but also on meeting the expectations of society as a whole. It is an alternative governance model responding to old public management's failures and the NPM paradigm (Sami et al., 2018).

The public value paradigm can appraise public programs and services' performance because of its quality and inclusiveness. Because of its usefulness, public value is popular in both advanced and developing countries. As an emerging paradigm, public value evaluates government actions and policies (Alford & O'Flynn, 2009; Bojang, 2020; Kelly et al., 2002). From the strategic management point of view, public value literature indicates two distinct views. First, public value as a normative concept should define government responsibility and citizens' rights and obligations. Second, citizens' willingness and acceptance of rights, duties, privileges, and obligations upon them. Moore (1995) proposes the strategic triangle (as a guide for public managers), which is both administratively feasible and wins public and government approval (Jacobs, 2014). Accordingly, the strategic triangle underscores tripartite demands on public sector managers: upwards over organizational and political structures, downwards via the management and operational lines, and outwards to the public (Moore, 1995). The public manager's goal ought to be to align the three points of the triangle. Below is the strategic triangle proposed by Mark H. Moore.
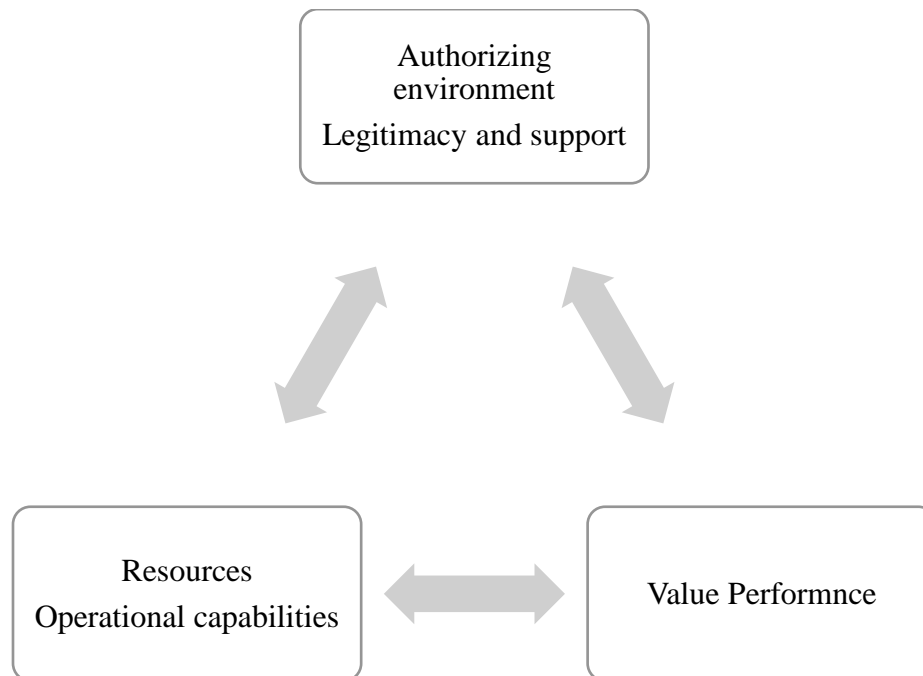
Figure 1: Moore's (1995) public value strategic triangle

For Moore, public managers' main role is to create public value that the public can only judge. From the strategic framework mentioned above, public value can be created via management trade-offs of three dimensions: (a) the determination of value which government seeks to create; (b) the 'bases of legitimacy and support' that are relied upon to sanction the government to take action; and (c) the resources essential to sustain the effort to generate that value (Mazzucato & Ryan-Collins, 2019). Moore contends that managers in the public sector have to reflect on the three dimensions at the same time to deliver the most anticipated value for the citizens. Dimensions in the strategic triangle are all intertwined in the role and function of the public manager, and his/her job is to maintain balance. Legitimacy and support guarantee the cooperation and flow of public funds coupled with wider approval from the public. Operational capabilities stress the availability of resources for the provision of public services value by the citizens. Public value is the most sought by citizens, depending on their experience, perception, and expectation. The British Cabinet Office expounded Moore's strategic triangle due to its practical viability (Ćwiklicki, 2016).

Kelly et al. (2002) interpret Moore's strategic triangle into services, outcomes, and trust. These building blocks resemble Moore's 'value circle,' 'authorizing environment,' and 'operational capability' (Williams & Shearer, 2011). Under the strategic triangle framework, public managers ought to think beyond mere policy implementation to more innovation and entrepreneurialism. Public managers have to adapt to the external environment via the engagement of the public. For a strategic organization in the public sector, public officials must consider the following issues:'(a) What is the central and essential value you are looking to create? (b) What agency or institution can authorize legitimacy and support or provide the necessary resources for value creation? (c) Does the agency has the operational capabilities needed to deliver this result?' (Moore, 1995; EY Report, 2014). However, strategic management is for public managers to imagine and articulate the public value in a legitimate, operationally doable, and supportive way (Moore, 1995).

Conclusion

The notion of public value is gaining popularity among practitioners and scholars due to its inclusiveness in appraising government policies and programs. This popularity is real in many developed countries as it aims to respond to the challenges and weaknesses of NPM in the 1990s. The concept of public value has now entered its maturity phase, and it clearly defines the role of public managers in providing socially desirable outcomes. This study aims to evaluate public programs and services' success more cost-effectively through the public value approach. The study also investigates how public managers and elected officials can use public value to guide their decision on resource allocation and hence create value for the citizens. This paper argues that public value provides a broader and inclusive appraisal tool than the conventional market-led approach. The adoption of public value presents a paradigmatic change in public administration. This transformation re-echoes the role of public managers to meet contemporary governance challenges.

From the investigation, the result indicates that public value is created by government or public managers in their daily transactions and by non-profit organizations that articulate their objectives and find popular support for the common good of the community. This finding corresponds with Moore's conclusion on who creates public value. Moore (1995) claims that:

> *"…defining 'public value' needs the active deliberation of not only citizens but also market and social sectors, including NGOs. Any sector that is interested in the collaborative development of society should be involved in deciding what is valuable, how to produce it, and how it should be measured"(Moore, 1995).*

The strategic triangle proposed by Moore can be a useful tool at the disposal of public managers to create opportunities that go beyond the policy implementation role to value production for citizens. Public value management stresses public sector invention and the worth of managers in the public sector. It is best viewed as a means employed by public managers to recognize and implement operational developments in the public sector organization. However, measuring public value remains problematic due to its elusiveness. The term 'Value' is a problem in itself as it is relative. This is because the value position of the individual citizen is subjected to change with time.

Further, Moore (1995) argues for managers to be platonic guardians of public interest. This position appears problematic because bureaucrats are motivated by self-interest who can turn the table in their favor. As Rhodes & Wanna (2007) asserted, it is a repackaging of bureaucratic self-interest. While the strategic triangle provides the starting point for evaluating and guiding public managers, the paper recommends its extension and a more robust public value measurement framework, especially toward the management control system.

Conflicts of Interest: The author declares no conflict of interest.

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A longitudinal Perspective on Efficiency of Airlines in Europe and the U.S

Minh-Anh Thi Nguyen [1*]

[1] Department of Shipping and Transportation Management, National Taiwan Ocean University, Taiwan, ROC;
* Corresponding author: minhanh777aof@gmail.com

How to cite?
Nguyen, M.-A. T. (2021). A longitudinal Perspective on Efficiency of Airlines in Europe and the U.S SEISENSE Journal of Management, 4(2), 11-24. doi: 10.33215/sjom.v4i2.591

The aviation industries in Europe and the US have been well-established since a very early age and have attracted great attention from both industry practitioners and academics. To derive a different perspective on the efficiency levels of airlines operating in the two matured markets, we adopted dynamic data envelopment analysis (DEA). Using the data of the period 2014 – 2016 of 7 European airlines and 9 US airlines that are publicly traded, the study offers an overall picture of airlines' efficiency in the two regions. Notably, the resource flow between the consecutive periods is incorporated into the measure to yield a longitudinal perspective on airlines' efficiency. The study reveals the two major findings. First, most publicly traded airlines in Europe and the US are efficient, except for Hawaiian airline headquartered in the US. Second, Hawaiian airline's inefficiency is majorly contributed by the overuse of the number of employees, consumed fuel, and the deficit of revenue seat-miles in 2014 and 2015. To improve the efficiency level, Hawaiian airlines could consider increasing employee productivity, using more fuel-efficient aircraft, and implementing new marketing strategies to boost sales.

Introduction

In an intensely competitive environment, being efficient has become a major requisition for any business (Liu et al., 2018). Particularly, for the airline industry, which is referred to as a capital-intensive business, efficiency has been of paramount concern to the operators. Understanding the airline's efficiency level benefits airline managers in devising strategies to improve or maintain the company's overall performance, thus strengthening their position on the market.

In response to the need for efficiency measures, there have been several proposed measures. In general, these measures can be majorly categorized into two approaches, namely, non-parametric and parametric. Compared to the parametric approach, the non-parametric approach, which is represented by data envelopment analysis (DEA) has gained greater attention from academics and industry practitioners (Emrouznejad and Yang, 2018). The popularity of DEA as a powerful tool for assessing efficiency can be explained by its ability to handle multiple inputs and outputs and no presumption of production form (Lampe and Hilgers, 2015). Given the superiority of DEA over other methods, it has been widely applied in analyzing the efficiency of the aviation sector (for instance, see comprehensive literature review of Yu et al., 2017; Arjomandi et al., 2018; Cui et al., 2016; Kottasa and Madas, 2018).

The airline industries in Europe and the U.S have been well-established, and underwent different stages of deregulation. The U.S airline industry was first deregulated in 1978. Meanwhile, the European airline industry experienced three phases of slower liberalization initiated in 1987, 1990, and 1993. The differences in the degree of air transport liberalization in these two markets have led to a proliferation of studies comparing the efficiency of airlines in these two regions (Morrell and Taneja, 1979; Good et al., 1993, 1995; Assaf and Josiassen, 2012). Due to the earlier deregulation, the airlines in the U.S seemed to be more efficient than the airlines in Europe (Good et al., 1993, 1995).

In this study, we reinvestigated the efficiency of airlines in Europe and the US. Differing from the prior studies, we adopted DEA measure, a popular tool for efficiency assessment. Furthermore, to provide a longitudinal perspective on airlines' efficiency in the two regions, we employed a dynamic DEA model. The dynamic DEA model could incorporate the resource flow between periods into the efficiency judgment, offering an overview of efficiency levels of decision–making units (DMUs) in the periods (Tone and Tsutsui, 2010). The dynamic DEA model has been successfully applied in evaluating airlines' efficiency in numerous studies (for instance, Omrani and Soltanzadeh, 2016; Yu et al., 2017; Cui et al., 2018). Besides, by using the data of the period 2014 – 2016 of 7 European airlines and 9 US airlines, we updated the overall picture of efficiency levels of the airlines in the two regions.

The paper is structured as follows: Section 2 provides the related literature; Section 3 demonstrates the adopted model for efficiency analysis; Section 4 presents the selection of variables and reports descriptive statistics of selected variables; Section 5 presents and discusses the empirical results; Finally, section 6 summarizes and concludes the major findings.

Literature Review

Europe and the U.S have presented the most mature markets in the global airline industry. In the past, there have been several studies on the efficiency of airlines of the two regions. For instance, Morrell and Taneja (1979) used ordinary least squares estimation procedure to gauge the efficiency of fourteen U.S and fourteen European airlines in 1975. The study's major findings indicated that the efficiency enhancement could be achieved through more liberty in the air traffic movements, the increase in frequency. The differences in U.S

and European airlines' efficiency levels could be driven by the differences in service, demand patterns, and route characteristics.

Good et al. (1993) employed Cobb-Douglas single output technology to assess the efficiency of the four largest European air carriers and their eight American counterparts over the period 1976 – 1986. The results of the study suggested that airlines in the US appeared to be more efficient compared to their European counterparts due to the greater liberalization. Also, the potential efficiency enhancement could be obtained by cutting the input resources while the outputs could be fixed at the produced levels.

Good et al. (1995) extended their previous study using both the parametric approach - Cobb-Douglas single output technology and non-parametric approach – data envelopment analysis (DEA) for their efficiency evaluation. The period 1976-1986 for the analysis was the time that the aviation industry in the US was significantly deregulated while the aviation market in Europe remained protected. The study found that the European airlines were less efficient than US airlines 15-20% on average. Considering resource consumption, airlines in Europe would have saved approximately $4 billion per year. Additionally, the authors specified the limitation of a parametric approach in providing upward biases in allocative efficiency estimations.

Assaf and Josiassen (2012) adopted a parametric approach - Bayesian distance frontier model to measure and compare the efficiency and productivity of 17 European and 13 US air carriers during the period 2001 – 2008. By imposing regularity conditions on the distance frontier model, the authors found that the European airlines were generally more efficient than the US airlines and displayed better productivity growth over the period. The low-cost carriers in both regions appeared to be more efficient than the full-service carriers.

In general, the existing studies on the efficiency of European and U.S airlines employed parametric approaches. As addressed in previous studies (Lampe and Hilgers, 2015), the major limitation of parametric approach is due to its presumption of relationships between inputs and outputs. Furthermore, it can be seen that most of the previous studies focused on the efficiency change/ productivity change over the periods; however, they ignored the linkage between the periods. The productions between periods are interrelated. According to Tone and Tsutsui (2011, 2014), such relationships can be demonstrated by carry-over activities/ products. Specifically, the products resulted from the production of a period join the production of a subsequent period. Such transitions of resources between periods involve in a dynamic production structure.

Several studies have used the dynamic production structure to investigate airline's efficiency. For instance, Omrani and Soltanzadeh (2016) used dynamic network DEA to consider both carry-over products and the internal structure of the operation of eight Iranian airlines during the period 2010 – 2012. In their study, the structure of Iranian airlines was assumed to contain two stages, namely production and consumption, and the number of seats of the fleet was perceived as carry-over products. The study's major findings indicated that the efficiency levels of Iranian airlines tend to be lower in the production stage.

Yu et al. (2017) also used dynamic network DEA to provide another perspective on airline operation's internal structure and the carry-over activities between periods. In specific terms, the dynamic production of 30 global airlines over the period 2009 – 2012 was decomposed into two stages, namely production and service; the number of self-owned aircraft and the number of waypoints were regarded as the carry-over products. The study reported several important findings as follows: (1) the weight/ the importance assigned to each stage significantly impacted the over efficiency estimations; (2) the overall efficiency of the evaluated airline shown a declining trend over the period; (3) the participation in airline alliances, the total assets, and the GDP affected the efficiency of airlines.

Cui et al. (2018) employed dynamic DEA to exploit the pollution abatement cost of the 18 global airlines during the period 2008 – 2014. The study denoted the capital stock as the carry-over product over the periods. The major findings of the study include (1) Delta airline demonstrated the largest pollution abatement cost; (2) the pollution abatement cost of most airlines declined over time; (3) the financial crisis in 2008 and the deployment of biofuel aircraft impacted on the changes in pollution abatement cost.

Considering the superiority of DEA in incorporating the dynamic effect in assessing efficiency, the current study applies dynamic DEA. Thus, the current study derives a perspective that is different from the existing studies on European and US airlines. The following section explains our applied model.

Methodology

We evaluate efficiency of N airlines – DMUs over T periods. In each period $t\left(t=1,...,T\right)$, each DMU

$j(j=1,...,N)$ consumes M common inputs $\boldsymbol{x}^{(t)}=\left(x_1^{(t)},...,x_m^{(t)},...,x_M^{(t)}\right)\in\mathfrak{R}_+^M$ and the P common carry-over

products which are resulted from the previous period's production $\boldsymbol{c}^{(t-1,t)}=\left(c_1^{(t-1,t)},...,c_p^{(t-1,t)},...,c_P^{(t-1,t)}\right)\in\mathfrak{R}_+^P$ to

produce common S outputs $\boldsymbol{y}^{(t)}=\left(y_1^{(t)},...,y_r^{(t)},...,y_R^{(t)}\right)\in\mathfrak{R}_+^R$ and P common carry-over products

$\boldsymbol{c}^{(t,t+1)}=\left(c_1^{(t,t+1)},...,c_p^{(t,t+1)},...,c_P^{(t,t+1)}\right)\in\mathfrak{R}_+^P$ which will join the production of the next period $\left(t+1\right)$. The

production of a DMU $\left(\boldsymbol{x}_o,\boldsymbol{y}_o,\boldsymbol{c}_o\right)$ is sketched in Figure 1.
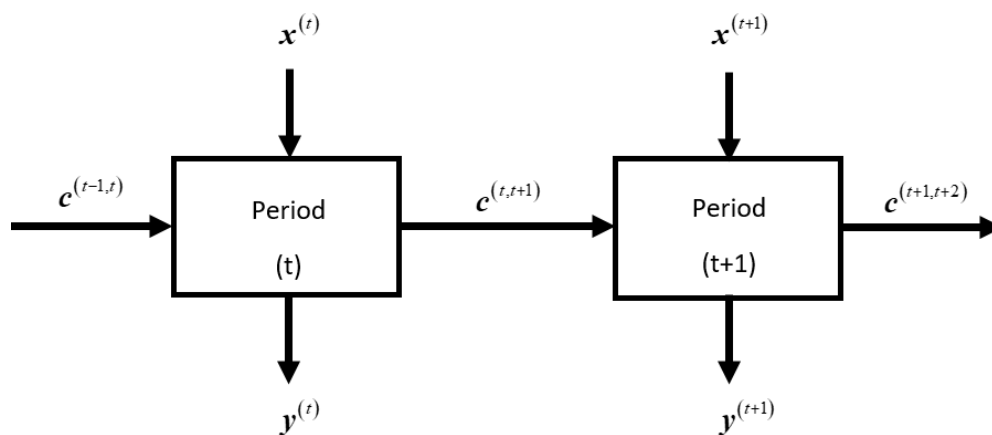
Figure- 1. Dynamic structure.

Following Tone and Tsutsui (2010), the carry-over product can be classified into four types, namely good, bad, free, and fixed. The meaning and the constraint for each type are different. Specifically, the good carry-over products are treated as desirable outputs, the bad ones are treated as inputs, the free ones are treated to freely adjusted and supposed to be under the control of DMU, the fixed ones are set fixed at the observed value, and

supposed to be out of control of DMU. For the details of the constraint representing each type of carry-over product, we refer the readers to Tone and Tsutsui (2010).

In our study, the carry-over products are not controlled by the airlines, and thus, the fixed type is employed.

Accordingly, the production technology under variable returns to scale (VRS) assumption can be expressed as:

$$T = \left\{ (x, c, y) : \sum_{j=1}^{N} \lambda_j^{(t)} x_{mj}^{(t)} \leq x_m^{(t)} \qquad m = 1, ..., M, \quad t = 1, ..., T \right. \tag{1}$$

$$\sum_{j=1}^{N} \lambda_j^{(t)} c_{pj}^{(t-1,t)} = c_p^{(t-1,t)} \qquad p = 1, ..., P, \quad t = 1, ... T$$

$$\sum_{j=1}^{N} \lambda_j^{(t)} y_{rj}^{(t)} \geq y_r^{(t)} \qquad r = 1, ..., R, \quad t = 1, ... T$$

$$\sum_{j=1}^{N} \lambda_j^{(t)} c_{pj}^{(t,t+1)} = c_p^{(t,t+1)} \qquad p = 1, ..., P, \quad t = 1, ... T$$

$$\sum_{j=1}^{N} \lambda_j^{(t)} = 1 \qquad t = 1, ... T$$

$$\left. \lambda_j^{(t)} \geq 0 \qquad j = 1, ..., N, \quad t = 1, ... T \right\} \in \Re_+^{M+P+R}$$

In which, $\lambda^{(t)}$ is intensity variable which establishes the linear combinations of variables in the production of period $t (t = 1, ... T)$.

It should be noted that the assumption of fixed carry-over products ensures the continuity of resource flow between periods (t-1) and t, and between periods t and (t+1), thus, there is no necessity to include the constraints $\sum_{j=1}^{N} \lambda_j^{(t-1)} c_{pj}^{(t-1,t)} = \sum_{j=1}^{N} \lambda_j^{(t)} c_{pj}^{(t-1,t)} (t = 2, ..., T)$.

To seek the simultaneous maximum potential input excesses and output shortfalls, the non-oriented dynamic slack-based measure (DSBM) model is adopted for assessing efficiency of US airlines. The dynamic efficiency of the evaluated DMU (x_o, y_o, c_o) can be estimated by solving the following mathematical problem:

$$Min \quad \frac{\sum_{t=1}^{T} w^t \cdot \left(1 - \frac{1}{M} \sum_{m=1}^{M} \frac{s_{mo}^{(t)(-)}}{x_{mo}^{(t)}} \right)}{\sum_{t=1}^{T} w^t \cdot \left(1 + \frac{1}{R} \sum_{r=1}^{R} \frac{s_{ro}^{(t)(+)}}{y_{ro}^{(t)}} \right)} \tag{2}$$

Subject to:
$$\sum_{j=1}^{N} \lambda_j^{(t)} x_{mj}^{(t)} = x_{mo}^{(t)} - s_{mo}^{(t)(-)} \qquad m = 1,...,M, \quad t = 1,...,T$$

$$\sum_{j=1}^{N} \lambda_j^{(t)} c_{pj}^{(t-1,t)} = c_{po}^{(t-1,t)} \qquad p = 1,...,P, \quad t = 1,...T$$

$$\sum_{j=1}^{N} \lambda_j^{(t)} y_{rj}^{(t)} = y_{ro}^{(t)} + s_{ro}^{(t)(+)} \qquad r = 1,...,R, \quad t = 1,...T$$

$$\sum_{j=1}^{N} \lambda_j^{(t)} c_{pj}^{(t,t+1)} = c_p^{(t,t+1)} \qquad p = 1,...,P, \quad t = 1,...T$$

$$\sum_{j=1}^{N} \lambda_j^{(t)} = 1 \qquad t = 1,...T$$

$$\lambda_j^{(t)} \geq 0 \qquad j = 1,...,N, \quad t = 1,...T$$

$$s_{mo}^{(t)(-)}, s_{ro}^{(t)(+)} \geq 0, \qquad m = 1,...,M, \quad r = 1,...,R, \quad t = 1,...,T$$

In which, $s_{mo}^{(t)(-)}, s_{ro}^{(t)(+)}$ are slacks of input and output in period t respectively, w_t is the weight/ importance of each period in the whole evaluated period, $\sum_{t=1}^{T} w_t = 1$. The objective of the model (2) is to seek the maximum slacks of inputs and outputs in each period.

As model (2) is in nonlinear form, to transform it into linear form, the Charnes-Cooper transformation is adapted (Tone, 2001). Multiplying both the denominator and numerator with $k(k > 0)$, the denominator is then set to be equal to 1. The model (2) then takes the following form:

$$Min \quad \sum_{t=1}^{T} w^t \cdot \left(k - \frac{1}{M} \sum_{m=1}^{M} \frac{k.s_{mo}^{(t)(-)}}{x_{mo}^{(t)}} \right) \tag{3}$$

Subject to
$$\sum_{t=1}^{T} w^t \cdot \left(k + \frac{1}{R} \sum_{r=1}^{R} \frac{k.s_{ro}^{(t)(+)}}{y_{ro}^{(t)}} \right) = 1$$

$$\sum_{j=1}^{N} k.\lambda_j^{(t)} x_{mj}^{(t)} = k.x_{mo}^{(t)} - k.s_{mo}^{(t)(-)} \qquad m = 1,...,M, \quad t = 1,...,T$$

$$\sum_{j=1}^{N} k.\lambda_j^{(t)} c_{pj}^{(t-1,t)} = k.c_{po}^{(t-1,t)} \qquad p = 1,...,P, \quad t = 1,...T$$

$$\sum_{j=1}^{N} k.\lambda_j^{(t)} y_{rj}^{(t)} = k.y_{ro}^{(t)} + k.s_{ro}^{(t)(+)} \qquad r = 1,...,R, \quad t = 1,...T$$

$$\sum_{j=1}^{N} k.\lambda_j^{(t)} c_{pj}^{(t,t+1)} = k.c_p^{(t,t+1)} \qquad\qquad p = 1,...,P, \quad t = 1,...T$$

$$\sum_{j=1}^{N} k.\lambda_j^{(t)} = k \qquad\qquad t = 1,...T$$

$$\lambda_j^{(t)} \geq 0 \qquad\qquad j = 1,...,N, \quad t = 1,...T$$

$$s_{mo}^{(t)(-)}, s_{ro}^{(t)(+)} \geq 0, \qquad\qquad m = 1,...,M, \quad r = 1,...,R, \quad t = 1,...,T$$

$$k > 0$$

Let us define $k.s_{mo}^{(t)(-)} = S_{mo}^{(t)(-)} \left(m = 1,...,M; t = 1,...,T \right); k.s_{ro}^{(t)(+)} = S_{ro}^{(t)(+)} \left(r = 1,...,R; t = 1,...,T \right);$ $k.\lambda_j^{(t)} = \Lambda_j^{(t)} \left(j = 1,...,N; t = 1,...,T \right)$. The model (3) then takes the following form:

$$Min \qquad \sum_{t=1}^{T} w^t. \left(k - \frac{1}{M} \sum_{m=1}^{M} \frac{S_{mo}^{(t)(-)}}{x_{mo}^{(t)}} \right) \qquad\qquad (4)$$

Subject to

$$\sum_{t=1}^{T} w^t. \left(k + \frac{1}{R} \sum_{r=1}^{R} \frac{S_{ro}^{(t)(+)}}{y_{ro}^{(t)}} \right) = 1$$

$$\sum_{j=1}^{N} \Lambda_j^{(t)} x_{mj}^{(t)} = k.x_{mo}^{(t)} - S_{mo}^{(t)(-)} \qquad\qquad m = 1,...,M, \quad t = 1,...,T$$

$$\sum_{j=1}^{N} \Lambda_j^{(t)} c_{pj}^{(t-1,t)} = k.c_{po}^{(t-1,t)} \qquad\qquad p = 1,...,P, \quad t = 1,...T$$

$$\sum_{j=1}^{N} \Lambda_j^{(t)} y_{rj}^{(t)} = k.y_{ro}^{(t)} + S_{ro}^{(t)(+)} \qquad\qquad r = 1,...,R, \quad t = 1,...T$$

$$\sum_{j=1}^{N} \Lambda_j^{(t)} c_{pj}^{(t,t+1)} = k.c_p^{(t,t+1)} \qquad\qquad p = 1,...,P, \quad t = 1,...T$$

$$\sum_{j=1}^{N} \Lambda_j^{(t)} = k \qquad\qquad t = 1,...T$$

$$\Lambda_j^{(t)} \geq 0 \qquad\qquad j = 1,...,N, \quad t = 1,...T$$

$$S_{mo}^{(t)(-)}, S_{ro}^{(t)(+)} \geq 0, \qquad\qquad m = 1,...,M, \quad r = 1,...,R, \quad t = 1,...,T$$

$$k > 0$$

Let us denote the optimal solution of the model (4) with asterisk, the optimal solution to (3) can be defined as:

$$s_{mo}^{(t)(-)*} = \frac{S_{mo}^{(t)(-)*}}{k^*}, \left(m=1,...,M; t=1,...,T\right),\tag{5}$$

$$s_{ro}^{(t)(+)*} = \frac{S_{ro}^{(t)(+)*}}{k^*}, \left(r=1,...,R; t=1,...,T\right),\tag{6}$$

$$\lambda_j^{(t)} = \frac{\Lambda_j^{(t)*}}{k^*}, \left(j=1,...,N; t=1,...,T\right).\tag{7}$$

The efficiency of DMU $\left(x_o, y_o, c_o\right)$ in period $t(t=1,...,T)$ can be estimated as follows:

$$E_o^{(t)} = \frac{1 - \dfrac{1}{M}\displaystyle\sum_{m=1}^{M}\dfrac{s_{mo}^{(t)(-)*}}{x_{mo}^{(t)}}}{1 + \dfrac{1}{R}\displaystyle\sum_{r=1}^{R}\dfrac{s_{ro}^{(t)(+)*}}{y_{ro}^{(t)}}}\tag{8}$$

The dynamic efficiency of DMU $\left(x_o, y_o, c_o\right)$ over the T period can be determined as:

$$E_o = \frac{\displaystyle\sum_{t=1}^{T} w^t \cdot \left(1 - \dfrac{1}{M}\displaystyle\sum_{m=1}^{M}\dfrac{s_{mo}^{(t)(-)*}}{x_{mo}^{(t)}}\right)}{\displaystyle\sum_{t=1}^{T} w^t \cdot \left(1 + \dfrac{1}{R}\displaystyle\sum_{r=1}^{R}\dfrac{s_{ro}^{(t)(+)*}}{y_{ro}^{(t)}}\right)}\tag{9}$$

Data and variables selection

In this study, we considered 9 US airlines (Alaska, Allegiant, Delta, Hawaiian, JetBlue, Skywest, Southwest, Spirit, and United Airlines) and 7 European airlines (Aegean, British Airways, easyJet, Lufthansa, Norwegian, Ryanair, and Wizz Air) over the period 2014 – 2016. The selected airlines are among the largest airlines operating in Europe and the US, thus representing the two regions' aviation industry. Besides, their parent companies are publicly-traded, which makes their data more transparent.

The selection of inputs, outputs, and carry-over products was made based on the availability of data and the existing literature. Regarding input variables, three inputs were chosen, namely full-time equivalent employees, fuel consumption, and available seat miles (ASMs). The variable of labor has been commonly used as input in efficiency evaluation in the airline industry (Assaf and Josiassen, 2012; Merkert and Williams, 2013; Yu et al., 2016; Chang and Yu, 2014; Merkert and Pearson, 2015; Saranga and Nagpal, 2016; Cao et al., 2015; Arjomandi et al., 2018; Barros and Wanke, 2015; Kottas and Madas, 2018). Fuel presents one of the most critical materials for an airline operation. The selection of this variable is consistent with prior studies (Tsionas et al., 2017; Cao et al., 2015; Gramani, 2012; Chow, 2010; Yu et al., 2016; Cui and Li, 2017). Besides labor and material inputs, capital input is another critical component for airline operations. Following Merkert and Pearson (2015), Yu et al. (2016), Saranga and Nagpal (2016), Barros and Couto (2013), ASM was treated as capital input. Regarding the output variable, revenue-passenger miles (RPMs) were chosen, representing the passenger traffic volume

handled by an airline. RPM has been widely accepted as a major output in efficiency evaluation of airlines in prior studies (Merkert and Pearson, 2015; Cui and Li, 2017; Kottas and Madas, 2018, Chang and Yu, 2014; Yu et al., 2017).

Table 1: Descriptive statistics of the selected variables.[1]

Variables	Minimum	Maximum	Mean	Std. dev.
2013				
Carry-over product				
Shareholder's equity (million dollars)	99.4	12,772.0	3,047.3	3,359.8
2014				
Inputs				
Number of employees	1,650	79,829	21,920	26,154
Consumed fuel (million gallons)	52.7	3,265.6	1,051.3	1,110.5
ASM (million seat-miles)	8,682.0	211,954.2	83,516.0	76,817.8
Output				
RPM (million passenger-miles)	1,632.5	177,553.1	68,692.6	64,391.2
Carry-over product				
Shareholder's equity (million dollars)	221.2	9,518.0	2,626.8	2626.0
2015				
Inputs				
Number of employees	2,040.0	78,649.0	22,141.3	26,304.7
Consumed fuel (million gallons)	55.3	3,388.9	1,004.9	1,100.6
ASM (million seat-miles)	10,223.7	218,138.2	87,013.9	76,978.4
Output				
RPM (million passenger-miles)	1,897.1	185,840.9	72429.6	65,258.3
Carry-over product				
Shareholder's equity (million dollars)	256.2	11707.2	3,528.7	3,517.9
2016				
Inputs				
Number of employees	2,093	81,002	22,940	26,793
Consumed fuel (million gallons)	71.0	3,412.6	1,004.4	1,088.9
ASM (million seat-miles)	11,925.2	223,281.4	91,480.2	78,090.6
Output				
RPM (million passenger-miles)	1,713.8	189,706.8	76,477.6	66,212.4
Carry-over product				
Shareholder's equity (million dollars)	281.9	13,085.7	3,877.4	3,738.9

Note: The value of shareholder's equity is adjusted for inflation.

Considering the carry-product which connects the two consecutive periods, we used the shareholder's equity. The shareholder's equity of the previous period is treated as an input for the subsequent period. After joining

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[1] Since the study focuses on the passenger operations, the inputs in our study such as the number of employees and the fuel consumption of combination carriers are supposed to be reported for the passenger operation only. For the reason that there is no such information presented in the reports, like the previous studies on efficiency analysis of airlines, the current study uses the total number of employees and the fuel consumption which might cover the cargo operation.

the production of a period, the amount of shareholder's equity is changed as a business outcome, thus, it can be treated as output. Our selection is in line with prior studies (Alperovych et al., 2013; Lu et al., 2014; Hung et al., 2014).

The data was collected from the annual reports of airline companies. Table 1 reports the descriptive statistics of the data.

Empirical results and discussion

The dynamic efficiency of Europe and the US was estimated using the model (4) with an assumption of equal weight assigned to each period. The dynamic efficiency estimations are reported in Table 2.

Table 2: Dynamic efficiency of European and US airlines over the period (2014 – 2016).

Airline	2014	2015	2016	Overall 2014 – 2016
US				
Alaska	1.000	1.000	1.000	1.000
Allegiant	1.000	1.000	1.000	1.000
Delta	1.000	1.000	1.000	1.000
Hawaiian	0.611	0.612	1.000	0.741
JetBlue	1.000	1.000	1.000	1.000
SkyWest	1.000	1.000	1.000	1.000
Southwest	1.000	1.000	1.000	1.000
Spirit	1.000	1.000	1.000	1.000
United Airlines	1.000	1.000	1.000	1.000
European				
Aegean	1.000	1.000	1.000	1.000
British Airways	1.000	1.000	1.000	1.000
EasyJet	1.000	1.000	1.000	1.000
Lufthansa	1.000	1.000	1.000	1.000
Norwegian	1.000	1.000	1.000	1.000
Ryanair	1.000	1.000	1.000	1.000
Wizz Air	1.000	1.000	1.000	1.000
Mean	0.976	0.976	1.000	0.984
Min	0.611	0.612	1.000	0.741
Max	1.000	1.000	1.000	1.000
Std.dv	0.097	0.097	0.000	0.037

As shown in the overall efficiency of airlines (column 5) in Table 2, all evaluated airlines in Europe and the US were efficient during the period (2014 – 2016), except for Hawaiian airline. The airlines which are publicly traded tend to be efficient. With the updated data, we found that the airlines in the US and Europe have now been more comparable in terms of efficiency level. It seems that the significant liberalization of the aviation market in Europe has helped the airlines in this region to catch up with the airlines in the US.

Furthermore, the adoption of dynamic DEA provides us a longitudinal perspective on airlines' efficiency throughout the analyzed period. Specifically, except for Hawaiian airline, all the evaluated airlines are deemed efficient during (2014 – 2016). This suggests that the stable and efficient operation of airlines over the period.

In contrast to other airlines, Hawaiian airline seems to be the least efficient one. Specifically, in 2014, and 2015 the airline attains efficiency levels of 61.1% and 61.2%, respectively. The year 2016 displays a remarkable improvement in Hawaiian airline efficiency with an efficiency score of unity. Thanks to the substantial progress made in 2016, the airline's overall efficiency level during 2014 – 2016 reaches 74.1%. To specify the wastes in input consumption and deficits in the Hawaiian airline's output production, we investigated the input and output slacks of the airlines. The information is recorded in Table 3.

As shown in Table 3, Hawaiian's inefficiency in 2014 is caused by the overuse of 2,373 employees, 45.47 million gallons of fuel, and the shortfall of 989 million revenue passenger miles. Meanwhile, in 2015, the airline has shown the overuse of 2,213 employees, 54.88, and the deficit of 1,080 million revenue passenger miles. In 2016, Hawaiian airline displayed an excellent deployment of resources and a reasonable traffic volume; thus, no slacks are indicated for this year.

Table 3: Input excesses and output shortfalls of European and US airlines over the period (2014 – 2016).

Airline	2014				2015				2016			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
US												
Alaska	0	0	0	0	0	0	0	0	0	0	0	0
Allegiant	0	0	0	0	0	0	0	0	0	0	0	0
Delta	0	0	0	0	0	0	0	0	0	0	0	0
Hawaiian	- 2,373	- 45.47	0	+ 989	- 2,213	-54.88	0	+1,080	0	0	0	0
JetBlue	0	0	0	0	0	0	0	0	0	0	0	0
SkyWest	0	0	0	0	0	0	0	0	0	0	0	0
Southwest	0	0	0	0	0	0	0	0	0	0	0	0
Spirit	0	0	0	0	0	0	0	0	0	0	0	0
United Airlines	0	0	0	0	0	0	0	0	0	0	0	0
European												
Aegean	0	0	0	0	0	0	0	0	0	0	0	0
British Airways	0	0	0	0	0	0	0	0	0	0	0	0
easyJet	0	0	0	0	0	0	0	0	0	0	0	0
Lufthansa	0	0	0	0	0	0	0	0	0	0	0	0
Norwegian	0	0	0	0	0	0	0	0	0	0	0	0
Ryanair	0	0	0	0	0	0	0	0	0	0	0	0
Wizz Air	0	0	0	0	0	0	0	0	0	0	0	0

Note: (1): Number of employees
(2): Consumed fuel
(3): Available seat-mile
(4): Revenue passenger-mile

Conclusion

The study reinvestigates the efficiency of airlines in Europe and the US over the period 2014 – 2016. Notably, this is the first time the transitions of resources between periods have been taken into account. Using the dynamic DEA models, the study offers a longitudinal perspective on the efficiency of publicly traded airlines in Europe and the US. Furthermore, the employment of the airlines' updated data has refreshed the overall picture of airline performance in the two regions.

The study's empirical results suggest that most publicly traded airlines in Europe and the US are efficient. Among 7 European airlines and 9 US airlines, only Hawaiian airline is inefficient with an overall efficiency level of 74.1 % over the period (2014 – 2016). Other airlines demonstrate extraordinary performance and maintain it over the period. The inefficiency of Hawaiian airline is majorly contributed by the overuse of the number of employees and consumed fuel and the traffic volume deficit in 2014 and 2015.

Regarding the study's limitation, it can be argued that our study has not dealt with the internal structure of the airline operation. The lack of data drives this limitation as the internal structure typically requires a greater number of input, output, and intermediate product variables. Thus, in the near future, we intend to extend our current study considering the internal structure of airline operation. Such an approach would provide more information on the underlying sources of inefficiency which exist in airline operation.

Additionally, the airlines included in our study adopted different business models such as full-service, low-cost, ultra-low-cost models. Due to the limited number of DMUs in the study, we could not test how the different business models affect the efficiency levels of airlines. Besides, some other concerns about the impacts of aircraft acquisition, network expansion, the economic environment should be addressed in future studies on the condition that the data are available.

Conflicts of Interest: The author declares no conflict of interest.

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Role of Knowledge Creation and Absorptive Capacity: A Panel Data Study of Innovation

Kamran Hameed[1], Noman Arshed ⓘ [2]*, Mubbasher Munir[3]

[1] Department of Management, University of Management and Technology, Lahore, Pakistan
[2] Department of Economics, University of Management and Technology, Lahore, Pakistan
[3] Department of Quantitative Methods, University of Management and Technology, Lahore, Pakistan
*Corresponding author: noman.arshed@umt.edu.pk

How to cite?
Hameed, K., Arshed, N., & Munir, M. (2021). Role of Knowledge Creation and Absorptive Capacity: A Panel Data Study of Innovation. SEISENSE Journal of Management, 4(2), 25-44. doi: 10.33215/sjom.v4i2.579

Abstract

Purpose- Knowledge creation refers to the ability of firms to create new knowledge that starts from individuals to integrating the firms and then the overall economy. This study suggests that knowledge acquisition in a country has a significant relationship with innovative performance.

Design/Methodology- Data from 48 highly HDI countries is taken from World Bank and World Economic Forum. Based on 480 country-year observations in a panel mediator model, it is revealed that the national efforts of boosting knowledge acquisition influence the firms' innovative performance.

Findings- Further, it is found that absorptive capacity in the employability of knowledgeable workers works as a mediator between knowledge acquisition and innovation. Whereby higher knowledge acquisition leads to higher absorptive capacity and higher innovation.

Practical Implications- This study builds a quantitative model for the macroeconomic context of knowledge-based view.

Introduction

In literature, various approaches have been used to address how firms can achieve sustainable competitive advantage. In the 1980s, the dominant paradigm in this field was proposed by (Porter, 1980) focusing on the five forces model. Later, one of the dominant approaches, 'Resource-based view' (RBV), emerged, discussing internal resources only as firm-level strategies are more prone to creating competitive advantage but less focused on rapid change in the external economic environment. In an extension in resource-based view, 'knowledge-based view' (KBV) of the firms considers as an emerging perspective that explains about achieving competitive advantage through knowledge-based assets, other than the conventional factor of production such as labor, capital, and land (Martín-de-Castro, Delgado-Verde, López-Sáez, & Navas-López, 2011).

In the last two decades, studies within the field of management literature have focused on the importance of knowledge management in achieving innovative performance. Innovation (based on Solow residual) is considered one of the critical factors of economic growth (Solow, 1956). Highly human-developed countries are focusing on knowledge that is prorogated as a crucial determinant of innovation. A country's knowledge acquisition is a resource that works as a driving force to innovative performance (Molina-Morales, García-Villaverde, & Parra-Requena, 2014). New solutions to existing problems can be proposed through new knowledge accumulated in R&D activities and absorbed into their skills and abilities (Zahra & George, 2002). Innovation has established its position as an essential ingredient for firms' performance (Ramadani, Abazi-Alili, Dana, Rexhepi, & Ibraimi, 2017) and long-term sustainable competitive advantage. The economic perspective has often cited innovation as a significant driver of economic growth and productivity (Freeman & Soete, 1997). To address the question "how innovation can be improved," various disciplines have come in front in the literature to answer this question (Anderson & West, 1996; Capon, Farley, Lehmann, & Hulbert, 1992; Freeman & Soete, 1997). Recently, the knowledge management field has emerged and has become critical approach to discuss innovation.

Novelty is created through innovation: "the development and adoption of new and improved ways of addressing social and economic needs and wants" (Kuhlmann, Shapira, & Smits, 2010). Broadly, it covers business sophistication and R&D innovation. Technological resources such as internet-wide accessibility (Song, Podoynitsyna, Van Der Bij, & Halman, 2008; Wirtz, Schilke, & Ullrich, 2010) and lack of barrier to entry have erupted as one of the significant challenges for established firms. Innovativeness determines firms' actions towards technological leadership, new product development, and change in the product. Innovation is an opportunity for highly developed human capital countries to stay competitive through knowledge acquisition in the current market environment. However, due to the ease of exchange of skilled workers around countries, it is a challenge to absorb through the hiring of these available, knowledgeable workers.

In the global marketplace, the winner firms do flexible innovation and timely respond to rapid environmental change coupled with internal and external knowledge resources management. Globalization, technological advancement, and other environmental factors direct firms to focus on closed innovation, which only focuses on internal research and development, to open innovation. This study covers both dimensions of open innovation: R&D, collaboration with other institutes, and considerable attention by scholars (H. Chesbrough, W. Vanhaverbeke, & J. West, 2014; Randhawa, Wilden, & Hohberger, 2016; Salampasis & Mention, 2017).

Previous literature has yet to develop, revealing the direct empirical relationship between innovation and knowledge acquisition. Competition between firms works as a strategic driving force toward innovation. European Union used this idea by providing resources to various knowledge, skilled labor, and venture capital (Rutten & Boekema, 2005). A country can achieve economic growth while executing this policy. However, innovation ingredients at the macro level are not well developed and measured. Firm-level theoretical perspectives are required to be seen at the macro level because firms are responsible for competing, which

aggregates towards growth strategically. Kleiner (2011) justified the application of resource theory, under system paradigm, on micro and macro-economic systems

This paper will start from a theoretical discussion. Hypotheses are developed in the same section. Research design and results are presented in the following section. Lastly, the conclusion and discussion are presented along with limitations and future research direction of the study.

Knowledge management influences firms' strategies. However, knowledge acquisition or creation has both time and cost-saving advantages. Knowledge acquisition has a time-proven critical role in the knowledge management process. In 1776, Adam Smith also affirmed in "An Inquiry into Nature and Causes of the Wealth of Nations" that productivity and quality can be maximized by investing in the employees' education and learning (Hanaysha, 2016). Corresponding to the same idea, Teece (1998) explained that a knowledge-based strategy could provide increasing returns; therefore, continuously learning fosters the firms' capacity to beat competitors in the long run. The conventional industrial economic model focused on machinery and financial capital. In the recent economic perspective, knowledge has become a primary factor of production (Tzortzaki & Mihiotis, 2014) which has proven itself especially in the knowledge-intensive services sector (Girma, 2017; Powell, 2003; Sveiby, 1997). Effective management of knowledge of a firm explains as a learning organization (Sinkula, Baker, & Noordewier, 1997). From a macro perspective, education and skills provide a foundation for learning and human development (N. Hanif & Arshed, 2016). Using knowledge as a competitive source, organizations develop internal capabilities and skills to manage their R&D activities (H. Chesbrough, 2003).

While grounding the theoretical model on knowledge management theory, it is indubitable to consider the role of tacit knowledge and its flow. People possess tacit knowledge (Ribeiro, 2013) and structure in mental schemas that may have been evolved through education. People struggle to compete in the job market through investing in quality education & skills. On the other hand, firms seek to hire workers those are possessing competitive knowledge and skills. Therefore, on one side, knowledge is created, and on the other side, the knowledge is being used to transform the individual into a valuable resource, i.e., an innovator. Therefore, the knowledge management process can be used as a practical approach towards innovation. To create value, open innovation (OI) provides new ideas through embracing external knowledge (H. Chesbrough, 2003). Chesbrough (2004) explained that external resources have a prominent position to create value. The concept of OI has been redefined by H. W. Chesbrough, W. Vanhaverbeke, and J. West (2014) as "a distributed innovation process based on purposively managed knowledge flows across organizational boundaries." However, literature has little cope to discuss the association of knowledge acquisition or creation as a significant antecedent of innovation.

Theoretical development in KBV described innovation dependency on human capital and their ability to respond towards innovative activities. However, their absorption capacity in firms determines the level of utilization within an economy towards the innovation process. New knowledge creation and ideation come from a higher level of education and training (Schmidt, 2005). This process increases the firm's absorption capacity (demand), increasing hiring of more skilled employees. Knowledge acquisition is a learning process within an organization, and the acquisition of external knowledge determines knowledge acquisition. Acquisition originates through associative actions with other organizations, universities, and consulting firms (Gonzalez & Martins, 2017). On one side, higher education and training work as an efficiency enhancer for sustainable growth and work as knowledge creation ingredients.

Problem Statement and Research Gap

In literature, little research covers both firms and economic perspectives towards innovation; therefore, this paper will be focusing on the aggregate behavior of firms operating in a country. In developed countries, knowledge does not restrict to regional boundaries, but it flows globally. Therefore, highly human capital

developed countries often address current challenges through appropriate systematic channels addressing retention or employment of knowledge workforce. In firm-specific research, limited research explains the aggregate role of scholarly society working in firms. The world is full of abundant resources, including knowledge not confined to one country or one region; it implies worldwide. On one side, people in a country are getting an education and acquiring new knowledge and skills; on the other side, they are being hired in organizations and using their knowledge to develop new ideas for innovation.

This deterministic behavior towards the innovation of a society can be explained through the positivist perspective. The knowledge acquisition process is not limited to individuals and organizational learning. Therefore, the ontological dimension, coming to be, of knowledge acquisition at the country level is missing in the literature and only covers the epistemological dimension at the firm level. Further, the relationship between theory and practice implies an epistemological position (Morgan & Smircich, 1980). KBV talks about the competitive advantage that can be created through intangible resources. These resources are deeply embedded in processes, routines, and the experience of the people. Human capital resources have a critical position to promote innovation. The epistemological position would be KBV of the firm that talks about implicit and explicit knowledge that enables organizations to develop existing knowledge to innovate by acquiring human capital resources. Knowledge resources are being acquired from the external environment. The capacity of organizations to deploy or hire people would be determined as a mechanism through which innovation would be developed.

Knowledge systems in developed countries are more successful in developing human capital than in less developed countries (Hanushek & Kimko, 2000; Hanushek & Woessmann, 2008); therefore, the education system in a country fosters skills and knowledge acquisition (Ryan & Niemiec, 2009). Because of this characteristic, this study will explore the role of knowledge acquisition in developed economies.

This new model is based on a knowledge-based perspective for the long-run growth, whereby innovation plays a significant role in sustainable economic development. Previous studies have focused on FDI, capital goods imports, and technology licensing, which were considered sources of technological knowledge (Cimoli, 2005). The global crisis forced us to rethink existing policies and focus on a knowledge-based economy, especially how individuals and organizations interact and accumulate knowledge (Padilla-Pérez & Gaudin, 2014). Exports and FDI have not proved to be the robust growth engines they were supposed to be. Second, the unfolding of the 2008–2009 global crisis made it more evident that markets by themselves do not lead to inclusive long-run economic growth and that active public policies are needed (Stiglitz, 2012). Therefore, the previously misdirected focus of researchers has been transferred to knowledge-based factors, and therefore, knowledge acquisition in a country through delivering quality education and developing skills determine as a critical driving force of innovation.

In comparison with knowledge distribution, studies support the positive link between knowledge acquisition from employees or the market with innovation (Cooper, 1979; Li & Calantone, 1998). Knowledge and skilled employees come from the external environment, and their engagement in industries helps develop capabilities within firms to perform R&D activities. On the other hand, the literature suggests that implicit knowledge has a limited role in innovation (Abbey & Dickson, 1983; Moorman & Miner, 1997).

According to Cohen and Levinthal (1990), absorptive capacity captures a firm's ability to value, assimilate, and apply new knowledge. In acquiring the process of new knowledge, firms focus on a knowledgeable workforce. The notion of knowledge acquisition affirms individuals' capacity to learn and generate new knowledge to transform a firm's capabilities. However, firms need to hire knowledgeable workers to utilize their new knowledge in operations and routines. It is evident from the literature that human capital is a fundamental pillar of knowledge-based companies (Bontis, Dragonetti, Jacobsen, & Roos, 1999). Knowledge-intensive companies

relatively employ a high number of knowledgeable workers. The higher the number of people working in an organization, determines higher absorptive capacity. It is an indicator of low unemployment in a country and making sense of optimal human capital utilization. Knowledge acquisition is not something stored in the brain, information systems, or in books (Cook & Brown, 1999; Gherardi, Nicolini, & Odella, 1998), but how much the demand for knowledgeable workers has been increased in firms yielding competitive advantage. Knowledge workers make smart action and create new knowledge that ultimately transforms into innovation. Therefore, in this study, absorption capacity – employment is considered to be a mediating variable.

Hypotheses Development

While encountering a competitive situation in the job market, people try to develop their skills and knowledge to participate in economic activity. Their learning capacity determines through their level of education and related experience. Therefore, knowledge creation, acquiring and transforming foster organizations' capacity to change their behaviors reflected in new insights and ideas (Epstein & Roy, 1997). Our framework covers the theoretical foundations of the knowledge management perspective, elucidating the role of knowledge creation/absorption in building the capacity to innovate through the mediating role of knowledge absorption capacity.

Research Questions

The main research questions of this study are:

1. To what extent knowledge acquisition have fostered open innovation?

2. To what extent absorptive capacity enhanced open innovation output?

Literature suggests that efficient implementation and adoption of innovation systems/practices is dependent on relevant formal institutions, i.e., intellectual property rights, technology licensing offices, R&D labs, academia, innovation centers, and technological incubators (Tödtling & Trippl, 2005). Economic institutions are defined as "rules of the game" in a society (North, 1990) and determinants of economic growth (Mauro, 1995).

Literature Review

Researchers have highlighted both organizational performance and sustainable development in the strategic management domain, linked with the firms' strategic orientation. (Cameron & Whetten, 1983) propagated the dimensionality of business performance on theoretical, empirical, and managerial grounds. The direction of theoretical perspectives under the strategic management firm performance is the ultimate strategic move (Schendel & Hofer, 1979). Here the first section would cover the role of innovation strategy towards firm performance in competitiveness. Firms' interaction enables firms to determine a required strategy to take a sustainable position in the market.

External knowledge considers being a critical source for a firm's innovativeness (Duysters & Lokshin, 2011). The firms often require the knowledge that society possesses in education and skills to achieve sustainable competitive advantage. In other words, knowledge acquisition is embedded in the labor force (Christensen & Drejer, 2005).

The literature on innovation has focused on exploring firms' strategies and their effect on firms' performance in economic and industrial terms. Previous studies highlighted researchers' interest in finding an empirical relationship between innovation strategies and firms' performance (Schroll & Mild, 2012; West & Bogers, 2014). However, little research has focused on causal factors of innovation at the macro level, focusing on knowledge, skills, and abruption capacity to hire skilled workers in industries.

Market compete heavily to get insight information, such as firms learn through interaction and perform actions based on product innovation's available information to exploit or explore markets. Research and development enable firms to determine the need of the external markets by bringing external knowledge within the organizations to respond accordingly. Making the R&D department is a strategic decision. Hiring skilled people to respond to the external environment also strengthen strategic decision.

Many authors empirically investigated that innovation promoting strategies have a strong association with performance. Firms compete and interact in markets through unique strategies and in resultant knowledge and ideas exchange. If a firm absorbs the external knowledge within the internal processes and routines, there would be higher chances to innovate successfully. Many authors highlighted open innovation strategies coupled with inbound and outbound OI (Cheng & Huizingh, 2014; Hernández-Espallardo, Sánchez-Pérez, & Segovia-López, 2011; Ortiz-de-Urbina-Criado, Montoro-Sánchez, & Mora-Valentín, 2012), and in this regard several authors confirmed the strategic role of collaboration with various partners including supplier, customers, competitors, and research institutions (Czarnitzki & Thorwarth, 2012; Un, Cuervo-Cazurra, & Asakawa, 2010; Vega-Jurado, Gutiérrez-Gracia, & Fernández-de-Lucio, 2009).

Open innovation activities are divided into two dimensions: firstly, inbound or outside-in open innovation that explains exploration and integration with external knowledge; secondly, outbound or inside-out open innovation that focuses on external avenues of exploitation of technological capabilities for the commercialization of technology (H. Chesbrough, 2003; Chesbrough & Crowther, 2006). Lundvall and Borrás (2005) emphasized science policies focusing on scientific knowledge, research, research and development laboratories, public research centers. The commercialization of innovation requires technology policies. The outcome of these activities results in economic growth (Verspagen, 1992).

It implies that a firm can collaborate with external organizations (Chesbrough & Crowther, 2006), such as through the product development process. It is a substitute for internal R&D, which reduces the internal R&D intensity of a company. It involves customers for product development activities. The outbound open innovation includes external collaboration in product development (Chesbrough, Vanhaverbeke, & West, 2006) and licenses out technologies to other firms (Henkel, 2006; Van de Vrande, De Jong, Vanhaverbeke, & De Rochemont, 2009). Outbound innovation focuses on developing ideas within the organization and then commercializing them in external markets. Outbound innovation is the way to develop ideas inside of the organization and commercialized them. This might be through the selective revealing a product to journalists and reviewers or selectively selling the technology or service to customers to get feedback. Therefore, both exploration and exploitation of knowledge resources for innovation activities trigger growth. Thus, investment in technology will increase the capacity of firms to maximize growth and profitability. The overall industry will grow in both ways; therefore, it will affect the overall growth of the industry.

The overall growth of an economy depends upon innovation systems. National innovation systems create competitive advantage and foster economic growth (Nelson & Rosenberg, 1993) and productivity (Kalim, Arshed, & Shaheen, 2019). Innovation systems consist of the following: infrastructure stability, and environment, and the nature of the relationship between them (Furman, Porter, & Stern, 2002). The structure of innovation systems facilitates interaction among small and large firms, public and academic communities. This process allows us to develop and improve technology and innovation.

Government policies have a significant role in promoting innovation activities. Focusing policies on academic institutions (universities) and research centers strengthen innovation systems in a country. Secondly, institutions implement laws, regulations, and policies necessary to supporting innovation systems (Cunningham & Link, 2016). There is a wide array of policy instruments that governments can implement to strengthen innovation systems. The government uses the following policies to develop innovation systems: public investment, trade

policies, straightening SME sector, training, education, and development at the regional level (Padilla-Pérez & Gaudin, 2014).

Knowledge management (KM)

The KBV states that the individuals possess the knowledge, and they exercise this knowledge; they are the actual owner of this knowledge, which creates value. From a social learning perspective, knowledge is an outcome of learning. Learning takes place through expenditure on health and education. Ultimately, it establishes the optimization of the values of individuals living in a society. They become more productive and efficient. This develops human values and brings competitive advantage and economic growth for the industries (Jashapara, 2004). The learning process would shape in the form of quality of education and skill set of people. The acquired knowledge and skills in a country are required to be absorbed in employment opportunities. This mechanism would impact overall innovation in industries. Knowledge management practices produce intellectual capital that plays their role toward economic growth (Jashapara, 2005).

For policymakers in highly human-developed countries, the recognition of innovation has been widely accepted. While developing human capital, the role of human productivity is witnessed through their role in business growth. For instance, in Central America, policymakers have recognized the importance of science, technology, and innovation toward sustainable economic growth.

Entrepreneurship and Absorptive capacity

The primary relationship between entrepreneurship and financial performance is diminishing financial returns. Entrepreneurial activities develop the new capacity of knowledge absorption by responding to opportunities. Entrepreneurship enables firms to capitalize on external opportunities innovatively. It develops the absorptive capacity that motivates firms to configure their knowledge-based resources towards the commercialization of activities. The notion of entrepreneurial orientation strategy focuses on creating and pursuing new market opportunities (Lumpkin & Dess, 1996).

As discussed earlier, knowledge absorption capacity determines through the potential of organization routines and processes to acquire, absorb and exploit knowledge (Zahra & George, 2002). For organization growth, the strategic posture of entrepreneurial orientation directs towards new opportunities. From EO perspective, it covers three dimensions: 1) innovativeness; it helps to use knowledge-based resources towards innovation, 2) proactiveness; it means identification of external opportunities, 3) risk-taking; it deals with uncertainty but helps to be a pioneer in new offering (Miller, 2011). Lastly, entrepreneurship channelizes in between firm performance and absorptive capacity by the commercialization of new knowledge.

KM & Innovation

H. W. Chesbrough (2003) and Segarra-Blasco, Garcia-Quevedo, and Teruel-Carrizosa (2008) emphasized the importance of external knowledge and its role towards internal R&D activities. Education, skilled and trained people are required within organizations to support internal R&D activities. They pointed out that new ideas and knowledge should be responded to avoid approaching new opportunities spontaneously. Otherwise, they will be lost. Therefore, firms can create new ways of value creation and maximize growth by combining external knowledge into internal R&D activities. The hiring of more knowledge or skill-based labor works as a mediating role in between knowledge creation and open innovation. According to Chesbrough (2007), he elucidated that the growing division of labor is an essential driving force towards innovation. A survey-based study on 120 SMEs of Indonesia by Gunawan, Jacob, and Duysters (2016) pointed out that cluster ties between industries moderate the knowledge acquisition and innovation relationship. Based on these ideas, the following hypothesis will be tested.

H1: Knowledge acquisition will positively affect innovation

Knowledge acquisition & Absorptive capacity

Earlier technological knowledge sources include importing capital goods, FDI and technology licensing (Cimoli, 2005). However, now, knowledge-based resources are considered to be more critical towards technological knowledge. Limited research has been done on linking the economic aspect of firms toward knowledge and skills available in the market and its causal relationship with innovation. Absorptive capacity would determine firms' ability to operate in a country towards acquiring knowledge that resides outside and develops new products and services. Absorptive capacity can be determined at two levels: firstly, potential absorptive capacity deals with the assimilation of knowledge, and secondly, realized absorptive capacity discusses the exploitation of knowledge. (Zahra & George, 2002). Lane and Lubatkin (1998) made the case that a firm might not learn equally from each external firm. It depends upon the capacity of individuals to learn quickly. The absorptive capacity of firms in a country will be higher if firms are prone to more employability of the skilled workforce.

Individuals' learning and development through acquiring knowledge make them more competitive. In competitive economies, people focus on education to make themselves more competitive in the job market. Their tacit knowledge is valuable for organizations competing on technological grounds. For these organizations, therefore, it is inevitable to lose capacity in giving jobs to help workers. Rothwell and Dodgson (1991) confirmed, firms should access knowledge from outside, including technicians, technological specialists, and engineers. Absorptive capacity develops within firms through hiring knowledge inputs: tertiary education, quality of math and science education, internet access in schools, availably of research and training services, quality of the educational system, quality of management schools, and extent of staff training. Knowledge input through knowledge and skills in a society facilities firms to hire people accompanied with competitive skills, therefore more employable opportunities would be generated in a country, and higher absorption capacity through employment channelize businesses towards innovation. Thus, the following hypothesis will be validated.

H2: Knowledge acquisition will positively affect Absorptive capacity

Absorptive capacity and innovation

The third hypothesis addresses the mediating role of absorptive capacity channelizing between knowledge acquisition and innovation. Firms need knowledge and information from both external and internal sources to develop a culture of innovative performance. Bringing external knowledge inside the organization and using it within processes and routines depends upon absorptive capacity (Zahra & George, 2002). Knowledge acquisition from external sources is necessary to achieve a competitive advantage. The limited capacity to absorb new knowledge restricts firms' ability to absorb new knowledge (Szulanski, 1996). Therefore, it is inevitable for firms to maximize absorptive capacity to craft new opportunities by acquiring new knowledge. External knowledge is available equally but might not bring equal benefits to every organization. In technological advancement, it all depends upon the current absorptive capacity of processes and routines. Therefore, organizations have to invest in labor force skills and their knowledge to achieve technological advancement (Keller, 1996).

According to Wong, Ho, and Autio (2005), changing nature of absorptive capacity has a significant influence on innovation. Innovation can be influenced through two possible reasons: firstly, targeting high skilled labor turns out to be more productive, and they could be directed towards innovative activities. Secondly, organizational, entrepreneurial activities could be streamlined using the absorptive capacity of skilled labor because they could easily turn into new opportunities.

H4: Absorptive capacity will mediate between Knowledge acquisition and Innovation

Conceptual model

Figure 1 elaborates the role of absorptive capacity as a mediating variable between knowledge acquisition and innovation. KBV explains the proposed association among mentioned variables. In a country, the education system determines the capability of individuals to perform in organizations. More knowledgeable people become part of the organizations, more competition tends to emerge, and more innovation will be seen. It turns out to be the competitive advantage of firms that can absorb knowledge by hiring competitive people while operating in highly developed human capital countries. In case of high demand for knowledge workers in an economy, more patents ideas would be registered in a country.
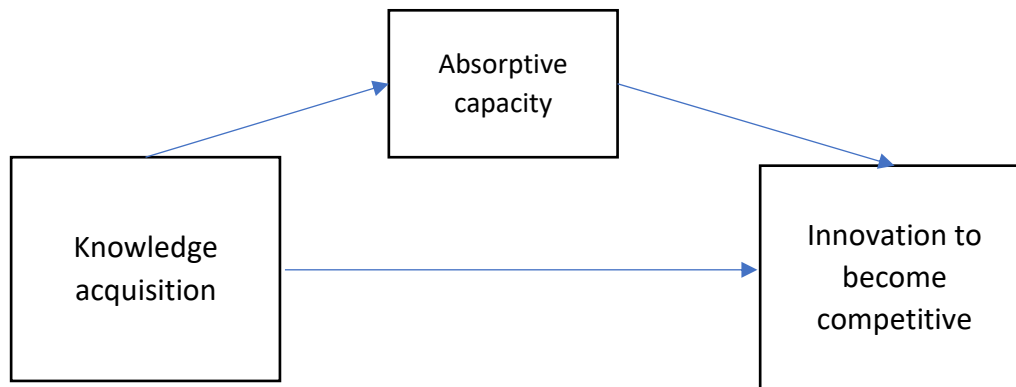

Figure 1 - Mediation model of Innovation

Methods

Data Framework and Sample

This study has constituted the panel data framework using country aggregate data (as it is deemed acceptable by (Kleiner, 2011) to minimize the multicollinearity among the independent variables. Further, this approach has several benefits, such as increased efficiency because of the bigger sample size, incorporation of knowledge spillover effect, and country-wise heterogeneity (N. Arshed, Anwar, Kousar, & Samra, 2018). The panel data model's use helps to study the differences in nation-wide organizational behavior and norms and explore the time evolution because of experience and exposure to new challenges. The Positivist paradigm is used in this study, which measures the social phenomena by selecting a large sample and careful selection of statistical tests (Creswell, 2009).

Data of variables (shown in Table 1) are drawn from World Bank and World Economic Forum. Since the emergence of a knowledge-based economy, High HDI countries have focused on developing human capital to stay in the competition. Earlier in the literature, the transaction cost theory model was operative in which cost minimization was the firm's strategy. Therefore, the cost can be cut to an extent as discussed knowledge-based resources are core for creating competitive advantage. Quality of education, quality of science education, training, and tertiary education, play an essential role towards human capital development and consider as a knowledge acquisition ingredient.

Innovation in a country consists of factors covering both government and industry contribution: Quality of scientific research institutions, company spending on R&D, availability of scientists and engineers, PCT patent applications, Government procurement of advanced technology products. Determinants of innovation are indicators of country competitiveness that have a strong association with knowledge acquisition.

This study has collected secondary data from 48 developed countries as per World Bank criteria to fulfill the research objectives, as they are a suitable candidate for knowledge economies. The data is taken from 2008-2017. The description of the variables is provided below.

Table 1 - *Variable Descriptions*

Indicator (Symbol)	Description	Source
Innovation Index (INNO)	Index Score (1-7)	(WEF, 2018)
Knowledge Acquisition Index (KA)	Index Score (1-7)	(WEF, 2018)
Absorptive Capacity, Unemployment (UNEM)	Unemployment % of Total labor force (modeled ILO estimate)	(WDI, 2018)
	Control Variables	
Development Expenditures (DEV)	Education and Health expenditures (% of GDP)	(WDI, 2018)
Institutions Index (INST)	Index Score (1-7)	(WEF, 2018)
Infrastructure Index (INF)	Index Score (1-7)	(WEF, 2018)
Trade Openness (OPEN)	Total trade (% of GDP)	(WDI, 2018)
New Business Density (NBD)	New business / population	(Business, 2018)

The dependent variable is the index of innovation proposed by the Global Competitiveness Index (WEF, 2018); this includes the following indicators: the capacity for innovation, quality of scientific research institutes, company spending on R&D, university-Industry collaboration in R&D, Gov't procurement of advanced tech products, availability of scientists and engineers and PCT patent applications / million population. Spending money on R&D generates new ideas that turn into innovation (Capon et al., 1992). Therefore, R&D activities become more competitive.

While the index of knowledge acquisition index includes gross secondary enrollment, gross tertiary enrollment, quality of education system, quality of math and science education, quality of management schools, internet access in schools, availability of research and training services, and extent of staff training, knowledge and skills development is only possible through quality of education, Existing empirical literature recognizes human capital created through investments in education and the development of skill as one of the most significant determinants of economic growth (R. Barro & Sala-i-Martin, 1995; R. J. Barro, 1991; Schultz, 1963). The control variable of institutions index comprises several indicators. These indicators include property rights, intellectual property protection, diversion of public funds, public trust in politicians, irregular payments and bribes, judicial independence, favoritism in decisions of government officials, the efficiency of government spending, wastefulness of government spending, burden of government regulation, the efficiency of the legal framework in settling disputes, efficiency of the legal framework in challenging regulations, transparency of government policymaking, business costs of terrorism, business costs of crime and violence, organized crime, reliability of police services, ethical behavior of firms, the strength of auditing and reporting standards, efficacy of corporate boards, protection of minority shareholders' interests and strength of investor protection. For efficient innovation systems, formal institutions have core importance that consists of institutes of licensing new technological ideas, innovation centers, academic institutes (Tödtling & Trippl, 2005).

Lastly, the index of infrastructure is comprised of quality of overall infrastructure, quality of roads, quality of railroad infrastructure, quality of port infrastructure, quality of air transport infrastructure, availability of airline seat km/week, quality of electricity supply, mobile telephone subscription / 100 population, and fixed telephone lines/100 population. Furman et al. (2002) found that innovation infrastructure and environment determine the strength of the innovation system.

Estimation Equation

Knowledge acquisition influences business innovation directly and indirectly through the channel of absorptive capacity. Hayes (2017) provides the foundation for the mediation model, which can help in identifying the direct (knowledge acquisition to innovation) and indirect channel (knowledge acquisition to innovation via absorptive capacity) of effects. Similar model was used by (Leal-Rodriguez, Roldan, & Ariza-Montes, 2014; S. H. Liao, Fei, & Chen, 2007).

$$Y_{it} = \alpha_0 + cX_{it} + dZ_{it} + \varepsilon_{it} \qquad (1)$$

$$Y_{it} = \alpha_1 + c_1X_{it} + bM_{it} + dZ_{it} + \varepsilon_{yit} \qquad (2)$$

$$M_{it} = \alpha_2 + aX_{it} + d'Z'_{it} + \varepsilon_{mit} \qquad (3)$$

Here c = Total effect

c_1 = Direct effect

ab = Indirect effect

Y = Dependent variable = Innovation (INNO)

X = Independent variable = Knowledge Acquisition (KA)

M = Mediator = Absorptive Capacity (UNEM)

Z & Z' = Control variablesEstimation Approach

Since the data sets are not mesokurtic, there are some differences among the countries used in the sample. This apparent non-homogeneity calls for panel data-based estimation models, which accounts for the heterogeneous differences and knowledge spillovers (Ramadani et al., 2017) among the countries by calculating country-specific standard errors of the slope coefficients (Greene, 2012). This model is known as Panel Feasible Generalized Least Square model. The advantage of this approach is that it can modify the matrix of country and variable standard errors, to control for heteroscedasticity, cross-sectional autocorrelation, and time-series autocorrelation (N Arshed & Kalim, 2020; N Arshed, Rauf, & Bukhari, 2021; N Hanif, Arshed, & Aziz, 2020; Hassan, Bukhari, & Arshed, 2019).

Results

Descriptive Statistics

Table 2 shows that none of the variables had a standard deviation higher than their mean value, confirming that they are not overdispersed, indicating the similarity of variables between countries and their movements in time. Further significant normality test (Jarque & Bera, 1987) confirms that all the variables are non-normal in their current nature. This indicates two things; first, the skewness is not zero. However, according to the central limit theorem (Lind, Marchal, & Wathen, 2012), the large sample size makes regression estimates asymptotic normal.

Table 2 – Data Descriptive

Variable	Mean	Std. Dev.	Skewness	Kurtosis	Normality Prob.
INNO	4.22	0.86	0.22	1.73	0.00
UNEM	7.66	4.63	1.57	6.04	0.00
KA	5.16	0.51	0.06	2.08	0.00
OPEN	117.7	83.65	2.01	6.89	0.00
NBD	6.46	6.27	1.78	6.25	0.00
DEV	9.89	3.75	-0.29	2.15	0.00
INST	4.79	0.86	-0.29	1.97	0.00
INF	5.17	0.83	-0.43	2.81	0.00

Figure 2 provides a scatterplot to present the graphical association between knowledge acquisition and innovation, where it can see that an increase in knowledge acquisition is positively associated with innovation. Empirically it is confirmed that higher investment in knowledge acquisition leads to higher technology level (Eicher, 1996). Knowledge motivates individuals to learn continuously to improve their skills (Orlikowski, 2002). Their learning behavior enables them to remain engaged with the organization. Similarly, Figure 2 shows
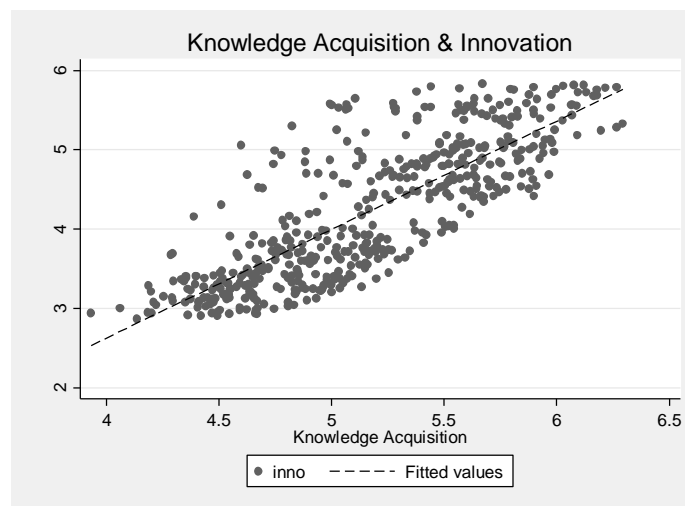

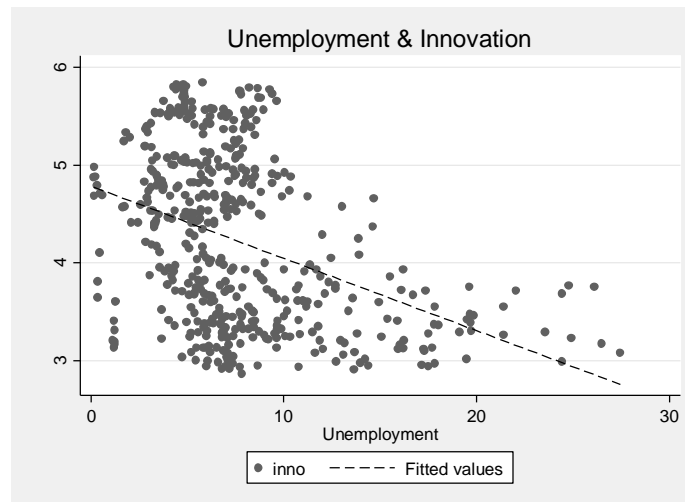*Figure 2 - Scatter plot of knowledge acquisition and innovation*

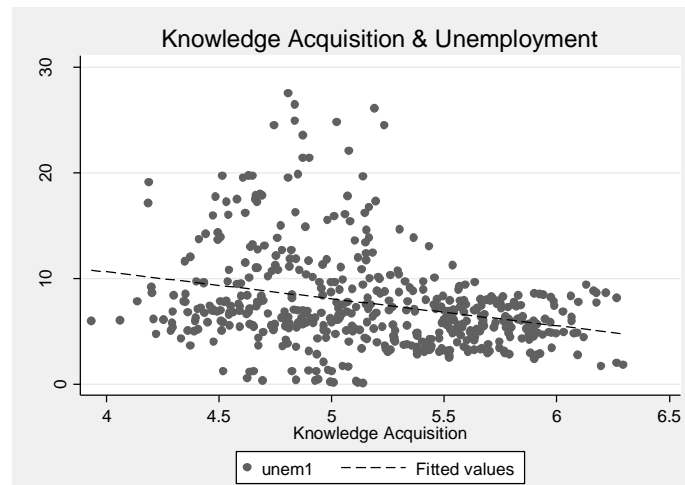*Figure 4 - Scatter plot of unemployment and innovation*

Figure 3 - Scatter plot of knowledge acquisition and unemployment

that unemployment being an inverse proxy of absorptive capacity has a negative association with innovation, indicating that knowledgeable resources increase the business's capacity to pursue innovation.

Figure 4 confirms the negative association between knowledge acquisition and the unemployment rate in the economy. Mincer (1991) highlighted that an increase in labor resource skill increases its demand because of an increase in its expected capacity to innovate.

Estimation Results

Three equations (eq. 1, 2, 3) are estimated to estimate the mediator model. The significant Wald test (in Table 3) shows that all the models are fit. While exploring the controlling factors, the increase in the development expenditures, institutions, and infrastructure significantly increases the innovations in the economy. Innovation depends upon geographical conditioning besides individual firms' efforts towards innovation. Geographical and institutional infrastructure development mobilizes technical resources from one place to another, which works as an essential factor in the innovation process (Feldman & Florida, 1994). Once the infrastructure is built, it becomes favorable for firms to experiment with the distinct strategy to get a competitive advantage; similar is the case for good institutes as they help reduce barriers (Segarra-Blasco et al., 2008).

Table 3 – Regression Estimates

	Panel FGLS Model Estimates		
Dep. Var.	**INNO**	**INNO**	**UNEM**
Indep. Var.	Coef. (Prob.)	Coef. (Prob.)	Coef. (Prob.)
KA	0.73 (0.00)	0.71 (0.00)	-1.86 (0.00)
UNEM		-0.02 (0.00)	
DEV	0.02 (0.00)	0.03 (0.00)	
INST	0.23 (0.00)	0.15 (0.00)	
INF	0.23 (0.00)	0.26 (0.00)	
NBD			-0.07 (0.00)
OPEN			-0.01 (0.00)
Constant	-2.09 (0.00)	-1.65 (0.00)	18.03 (0.00)
Sample	385	385	398
Wald	6226 (0.00)	5964 (0.00)	173.51 0.00)

While analyzing equation 3 (in Table 3), an increase in trade openness and entrepreneurship increases the absorptive capacity (by decreasing unemployment). Globalization generates employment opportunities that absorb access to labor from the market. Secondly, a segment of individuals who start up their businesses (based on opportunity or necessity) has some new innovative ideas. They assimilated into an economy and played their part toward innovation activities. Self-employment reduces unemployment in a country (Audretsch, Carree, & Thurik, 2001).

Here, a 1% increase in the knowledge acquisition index increases by 0.73% in the innovation index and a 1.86% increase in absorptive capacity leading to acceptance of alternative hypotheses (H1 and H2). This overall total effect is comprised of a direct effect whereby a 1% increase in the knowledge acquisition leads to directly increasing the innovation by 0.71% while indirectly increasing innovation by 0.037% via the absorptive capacity channel1. S.-H. Liao, Wu, Hu, and Tsui (2010) Molina-Morales et al. (2014) also found a statistically significant relationship between knowledge acquisition and innovation. The procedure to test the significance of the mediation effect is proposed by (Baron & Kenny, 1986; MacKinnon, Warsi, & Dwyer, 1995). Here significant test values of Sobel (1982), Goodman (1960), and Aroian (1944) tests shown in Table 4 confirm the presence of mediation effect.

Table 4 – Mediation Test

	Test Statistic	Std. Error.	P-value
Sobel Test	5.71	0.01	0.00
Aroian Test	5.69	0.01	0.00
Goodman Test	5.73	0.01	0.00

Discussions

The results pointed out the empirical outcomes of the theoretical model using extensive panel data. This study started with the hypothesis that knowledge acquisition could create a competitive advantage for the firms by expanding the absorptive capacity. The negative effect of knowledge on unemployment and the negative effect of unemployment on innovation confirmed this hypothesis.

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[1] Since the coefficient value of a and b in equation 2 and 3 are significant hence it can be expected that the cross product is also significant.

Conclusion

Conventional wisdom states that organizations hold, protect, and intend to increase their technological and innovation knowledge. Without considering the macro-economic environment, organizations could not assess a complete picture of factors affecting their innovation capacity. Intangible resources (idiosyncratic resources) under RBV can create a competitive advantage. These resources have specific characteristics: valuable, rare, inimitable, and non-substitutable (Barney, 1991), which would lead to a competitive advantage. The same applied to the economic perspective, where expenditure on knowledge and skills develops the resources that can be competitive. So, the possessed knowledge of the people cannot be partible; instead, it grows in the long run. Education increases human capital and, in turn, increases their absorptive capacity, innovation, and economic growth via business competitiveness. This development process of knowledge over time shapes innovation – engineers, quality research, and economic growth. Knowledge growth has not been limited to firms, but it goes beyond the country to a global level. The current challenges faced by high human development countries have been observed to design and implement a systematic policies framework toward sustainable industrial and economic growth. Conventionally, FDI, import of capital goods, and licensing technology considered technological knowledge sources (Cimoli, Ferraz, & Primi, 2005).

However, knowledge acquisition such as knowledge and skills sources have significant importance towards innovation. Therefore, a knowledge-based economy (KBE) drives the economy through using knowledge, production, and processes. In contrast, the production-based economy only focuses on growth accelerators such as factors of production and technology, but it ignores the function that relates to knowledge management.

This study concludes with important policy implications needed for developing a systematic policy mechanism for the innovation process. The policy should be focusing on a sufficient budget on quality of education and infrastructure development. This approach provides a platform and develops the capacity of individuals to learn and grow. Secondly, their sustainability by deploying into the job market consider to be challenging but would work as long as the knowledge acquisition process is competitive. Thirdly, innovation models need to be reassessed and redirect by focusing on human capital development that covers a couple of things such as health, food, and education. Healthy nations would be more mentally strong, more competitive to learning and innovation, and valuable toward overall economic growth. Researchers may check other intermediary variables such as talent and health to see the association between knowledge acquisition and innovation as the results are limited within the model.

Conflicts of Interest: The authors declare no conflict of interest.

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Behind Covid-19: Panic Buying, Service Convenience in Modern Market Indonesia

Nourissa Dinda Syachadi[1], Agatha Christy Avega Dumatri[2], Muhammad Fajar Wahyudi Rahman[3], Hujjatullah Fazlurrahman[4]*

[1,2,3,4] Department of Management, Faculty of Economics, Universitas Negeri Surabaya, Indonesia
* Corresponding author: hujjatullahfazlurrahman@unesa.ac.id

How to cite?
Syachadi, N. D., Dumatri, A. C. A., Rahman, M. F. W., & Fazlurrahman, H. Behind Covid-19: Panic Buying, Service Convenience in Modern Market Indonesia. SEISENSE Journal of Management, 4(2), 45-55. doi: 10.33215/sjom.v4i2.584

Abstract

Purpose- This study aims to analyze the effect of panic buying and service convenience on consumer purchasing decisions in modern markets such as mini markets, supermarkets, and hypermarkets in Surabaya.

Design/Methodology- This research makes use of a quantitative approach. The object of this research is consumers who shop at grocery stores during the Covid-19 pandemic between March and June 2020 in the city of Surabaya, East Java, Indonesia. Within this research, 84 respondents were used as the sample. The process of collecting the data was conducted through online-based questionnaires. Multiple linear regression analysis with the help of SPSS 23.0 software was used to analyze the research.

Findings- The researchers concluded that all existing hypotheses both H1 and H2, were valid. It also showed a significant positive relationship between panic buying, service convenience, and consumer purchasing decision behavior.

Practical Implications- Furthermore, the results stated that the modern market must understand the community's conditions and keep up with the latest situation surrounding customers' needs.

Introduction

The Covid-19 pandemic has a profound impact on all domains of our lives. Something uncertain creates very negative emotions, such as fear, panic, and anxiety (Thukral, 2020). Existing anxiety occurs not only because of virus transmission but also because of anxiety in meeting people's basic needs. Several countries reported the phenomena of panic buying as a response to this pandemic. Besides Covid-19, panic buying has also spread throughout the world from Singapore to the United States, reporting long queues at supermarkets for several weeks due to many consumers wanting to buy basic necessities such as rice and hand sanitizers to toilet paper (Thukral, 2020). In Indonesia, after the announcement of two Indonesian citizens infected with Covid-19 in March 2020, people began to make excessive purchases of necessities, hand sanitizers, and masks. These products have been invaded by the people of Jakarta (Putra, 2020).

The Indonesian government imposes Large-Scale Social Restrictions (PSBB) as listed in Government Regulation No. 21 of 2020 (Pemerintah Indonesia, 2020). PSBB regulates restrictions on activities in public places or facilities. Due to this restriction, people are in a rush to go to retail stores to buy household needs as a precautionary measure and supplies at a later time (Rahman, 2020). As reported on the CNN.com page, Chairperson of the Crisis Center of the University of Indonesia, Dicky Palupessy, stated that the panic buying phenomenon hit the public because the anxiety triggered it due to the outbreak of Covid-19. It was also caused by the lack of information received by the public regarding Covid-19. The phenomena of panic buying have either positive or negative impacts. The Ministry of Cooperatives and SMEs, Teten Masduki, said several sectors benefited from this pandemic. The increase in the purchase of staples jumps to 350% (Indraini, 2020). However, this increase was accompanied by other negative impacts, namely rising prices, scarcity of goods, and speculators of individual elements of the community.

Consumers' anxiety during this pandemic shows that there is an intensity of society to meet product supplies due to fear and uncertainty. Consumers buy products in large quantities intending to avoid supply shortages that may occur in the future. This does not only happen in Jakarta, but this also occurs in several areas such as the City of Surabaya and some other cities (Wahyudi & Setiawan, 2020). Nicola et al. (2020) stated that the food sector, including food and retail distributors, is under pressure because of panic buying. This has raised some concerns about food products. Therefore, it can be concluded that the phenomena of panic buying become the part of consumers' behavior caused by personal (psychological) and environmental factors that influence purchasing decisions.

Limitation of social activities during a pandemic has affected various business sectors and the economy. One of the most affected business sectors is the retail business. Like the existence of a modern market-type retail store, one sells and provides all kinds of basic daily needs (Hidayatullah & Pandamsari, 2020). This type of retail store's existence answers the needs of residents who cannot go to traditional markets due to PSBB or concerns about being exposed to Covid-19. Based on DBS Group data, until 2019, most Indonesians choose to shop at traditional markets, around 70%, rather than modern needs such as minimarkets or supermarkets. About 23% of residents choose to shop at mini markets and 7% at supermarkets. However, the current condition encourages people who previously prefer to shop to switch to the nearest supermarket or mini market or those that can be reached with little effort. One reason is that modern markets such as mini markets or super markets have advantages such as convenience and ease of access, especially since most mini markets currently operate for up to 24 hours in strategic locations such as close to housing or villages. In mid-March, Hippindo Front Advisor Tutum Rahanta, said that crowds continued to occur amid the Covid-19 pandemic. This is because many people visit mini markets or super markets to buy basic necessities and support activities at home (Hidayatullah & Pandamsari, 2020).

The retail business needs to survive amid this uncertain situation where companies must adapt quickly, responsively, and sustainably. Shifting consumer behavior patterns must be able to be correctly understood by the company. One of them is the convenience of service, which is part of the service marketing mix aiming to reach the target marketer. When customers can easily and comfortably feel the benefits of a service, they tend to be more satisfied with the service, known as service convenience (Chang et al., 2010). These are the factors that are considered in consumer purchase decisions.

This study aims to analyze the effect of panic buying and service convenience on consumer purchase decisions in modern markets such as mini markets, supermarkets, and hypermarkets in Surabaya.

Literature Review

Consumer Behavior

According to Schiffman & Wisenblit (2015), consumer behavior is a study of consumer actions while looking for, buying, using, evaluating, and disposing of products and services they hope will satisfy their needs. Consumer behavior also explains how individuals decide to use available resources, namely (time, money, and effort) for goods offered by marketers for sale (Schiffman & Wisenblit, 2015). In a study conducted by András & Tamás (2020), which was conducted as a result of Covid-19, it was explained that the threat of this virus caused an intense panic response to occur in March 2020. The majority of respondents in this study reported an increase in spending in the first week of this stage of the crisis. Furthermore, András & Tamás (2020) stated that the threat of Covid-19 has a significant impact on the entire retail sector in Hungary due to changes in customer shopping behavior.

Purchase Decision

According to Kotler & Keller (2013), Purchase decisions are part of consumer behavior, namely how individuals, groups, and organizations choose, buy, use, and how goods, services, ideas, or experiences satisfy their needs and desires. Widyastuti & Alwani (2018) stated that consumers' personal and environmental aspects had influenced consumers' purchase behavior. During the pandemic of Covid-19, consumers' buying products were significantly affected by anticipatory anxiety since the price of goods increased, controlled by a group or media exposure (Roy et al., 2020). András & Tamás (2020) found that 87% of people involved in the survey reported that they made extra purchases to increase the stock of certain product groups at home. Changing shopping behavior is reflected in the avoidance of different product ranges (András & Tamás, 2020). In that case, purchase decisions are influenced by drastic environmental changes, which can pave the way to reduce and combat post-traumatic disruption in times of crisis or to combat pandemic-related fears.

Panic Buying

According to Lins & Aquino (2020), panic buying is more often observed during crisis periods and disturbing events. Still, it is not only stress caused by these events but also personal crises. Panic buying appeared to respond to stress during the Covid-19 pandemic (Garfin et al., 2020). Panic buying is often seen during a pandemic or epidemic, which leads to a lack of resources. Media coverage of resource shortages and essential matters of daily life increases the tendency to panic buying (Roy et al., 2020). Researchers consider that panic buying does not only arise because of stress, but there are other explanations. However, only a few studies have examined or discussed the phenomenon of panic buying; among the research references, there is an article from Garfin et al. (2020), which describes stress as a trigger for panic buying. The article Tsao et al. (2019) makes a systematic model calculation of the sale of goods during a panic buying situation. Furthermore, an article by Bacon & Corr (2020) explains that panic buying related to Covid-19 is an adaptive mall behavior due to psychological conflicts in individuals. Then in a study conducted by András & Tamás (2020), which was

conducted in Hungary regarding panic buying that occurred due to Covid-19 which explained that the threat of this virus caused an intensive panic response to occur in March 2020.

Ho et al. (2020) explain the problem of panic buying in Singapore that occurs after the disaster response status has increased; people buy goods to maintain food supplies. Arafat et al. (2020) answered the causes of panic buying from consumer behavior factors, namely the perception of scarcity of goods. This means that panic buying can occur because many people think that certain items will be scarce during an outbreak of disease. The anxiety on the broader community can lead to panic buying during the Covid-19 outbreak (Roy et al., 2020). In Covid-19, panic buying behavior occurs because people experience psychological conflicts between the desire to stay safe and the desire to live an everyday and pleasant life (Bacon & Corr, 2020). Panic buying occurs when consumers buy products to anticipate price increases or product scarcity when or after a disaster occurs, regardless of whether the risk occurs or not. Longitudinal studies show that the stress response increases when there is an event that threatens physical and mental health over time (Garfin et al., 2020). The stress response can also increase help-seeking behavior that is unbalanced and inappropriate to do in response to an actual threat (Garfin et al., 2020).

Service Convenience

Service convenience where when customers can easily and comfortably feel the benefits of a service, they tend to be more satisfied with the service (Chang et al., 2010). Service convenience is also defined as one of the strategies of a company, or business actor to meet needs to minimize time and effort for consumers to get benefits (Sains et al., 2016). Besides that, service convenience is one-way companies can increase customer value (Sains et al., 2016). The findings also provide managerial insights that can save customers time and effort, including offering an acceptable level of service comfort and improving the service quality. Even service providers must realize the importance of convenience in transactions. Business actors certainly have to mobilize energy to train cashiers (Benoit et al., 2017).

Relationship Between Variables

Panic Buying and Purchase Decision

Based on the previously described literature findings, it can be concluded that consumer purchasing behavior is influenced by several factors, both internally and externally. This study aims to analyze the factors that influence purchasing decisions. The variables used in this study are the panic buying variable and service convenience. Where the panic buying variable is a factor that affects consumer purchasing behavior personally. Arafat et al. (2020) stated that Covid-19 has had huge impacts on the entire retail sector due to the changes in shopping behavior in society. András & Tamás (2020) claimed that there is panic buying where people want to fulfill their basic needs by making extra purchases to increase stock in several types of products. Panic buying raises sudden, uncontrolled behavior, occurs in many people, such as during the Covid19 pandemic, shopping excessively caused by worries about something that will happen in the future (Shadiqi et al., 2020). The cause of panic buying from consumer behavior factors is the perception of scarcity of goods in feelings of discomfort and instability of a situation. Furthermore, in this study, variable panic buying is measured by several indicators, which include anticipatory anxiety, fear, group mentality, uncertainty, uncontrolled, wrong information, media exposure. So it can be hypothesized as follows:

H1: Panic buying has a positive effect on purchasing decisions

Service Convenience and Purchase Decision

Furthermore, purchase decisions can also be influenced by the service factors provided by retail stores. In this study, service factors can be measured using variable service convenience. The emergence of service providers

is increasingly important for consumer convenience and traceability, such as increased comfort in stores to find products. Furthermore, service providers must mobilize personnel to train cashiers and minimize the time needed in the checkout process (Benoit et al., 2017). This variable is measured through indicators of the convenience of decision-making, the convenience of access, convenience of transactions, and benefits (Aagja et al., 2011).

H2: Service convenience has a positive effect on purchasing decisions

Hypothesis Development
The relationship between variable panic buying (X1), service convenience (X2), and purchase decision (Y) can be seen in Figure I.
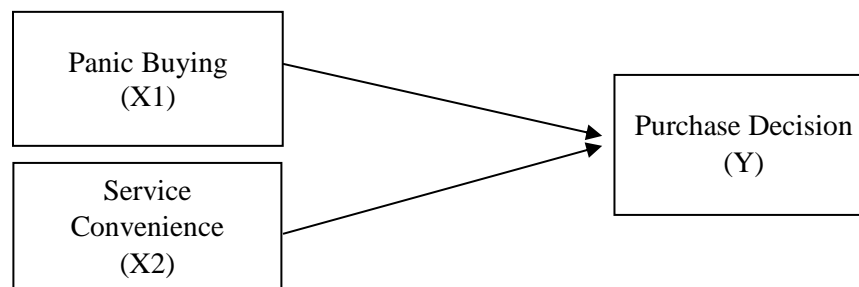

Figure 1 - *Research Model*

Methodology

This type of research uses a quantitative approach. The object of this research is consumers who shop at grocery stores during the Covid-19 pandemic between March and June 2020 in the city of Surabaya, East Java, Indonesia. The sampling technique in this study is non-probability sampling with the type of judgmental sampling in which the sample is selected based on the researcher's assessment as following the criteria determined by the researcher. (Malhotra, 2016). The researcher used 84 respondents as the sample. Based on the rule of thumb for sample size, according to Roscoe (1975), it states that sample sizes greater than 30 and less than 500 are appropriate for most studies conducted (Sekaran & Bougie, 2016).

For convenience in data collection, the process was done through online-based questionnaires. Questionnaires were created via google form and were spread out through online social media such as Email, Instagram, and WhatsApp. The questionnaire later contains questions according to the research indicators and is measured using a 5-point Likert scale ranging from 1 strongly disagree to 5 strongly agree. Multiple linear regression analysis with the help of SPSS 23.0 software was used to analyze the research data. The characteristics of the respondents in this study were men and women aged 18-56 years, buying daily necessities in modern markets such as Hypermart, Indomaret, Alfamart, and others.

Results

Descriptive Frequency Statistics
Table 1 shows that female respondents account for 75% of the total number of respondents. The majority of these respondents were aged 18-27 years, as much as 95%. According to the survey, 69% of respondents visited the Indomaret modern market.

Table 1: Descriptive Frequency Statistics

Variable		Frequency	Percentage
Gender	Male	21	25%
	Female	63	75%
Age	18 – 27	80	95%
	28 – 37	3	3.6%
	38 – 47	1	1.2%
	48 – 57	1	1.2%
Modern market	Alfamart	19	22.6%
	Giant	2	2.4%
	Hypermart	3	3.6%
	Indomaret	58	69%
	Superindo	2	2.4%

Construct Validity

Table 2 provides the results for the validity stated that all variables are valid because they have a value R-count greater than the R-table for each variable.

Table 2: Validity and Test Result

Variable	Items	R-count	R-table	Status
	X1.1	0.684	0.361	Valid
	X1.2	0.749	0.361	Valid
	X1.3	0.772	0.361	Valid
	X1.4	0.786	0.361	Valid
	X1.5	0.785	0.361	Valid
Panic Buying	X1.6	0.729	0.361	Valid
(X1)	X1.7	0.605	0.361	Valid
	X1.8	0.599	0.361	Valid
	X1.9	0.625	0.361	Valid
	X1.10	0.630	0.361	Valid
	X1.11	0.789	0.361	Valid
	X1.12	0.350	0.361	Valid
	X2.1	0.771	0.361	Valid
	X2.2	0.665	0.361	Valid
Service	X2.3	0.806	0.361	Valid
Convenience	X2.4	0.812	0.361	Valid
(X2)	X2.5	0.643	0.361	Valid
	X2.6	0.777	0.361	Valid
	X2.7	0.729	0.361	Valid
	X2.8	0.804	0.361	Valid
	X2.9	0.771	0.361	Valid
	X2.10	0.561	0.361	Valid
	X2.11	0.607	0.361	Valid
	Y1.1	0.740	0.361	Valid
	Y1.2	0.722	0.361	Valid
	Y1.3	0.723	0.361	Valid
Purchase	Y1.4	0.632	0.361	Valid

Decision	Y1.5	0.716	0.361	Valid
(Y)	Y1.6	0.536	0.361	Valid
	Y1.7	0.555	0.361	Valid
	Y1.8	0.579	0.361	Valid
	Y1.9	0.519	0.361	Valid
	Y1.10	0.567	0.361	Valid

Reliability and Test Result

The reliability test results in Table 3 show that all constructs have a value of more than 0.70. Thus, all measurement models used in this study already have high reliability.

Table 3: Reliability and Test Result

Variable	Cronbach's Alpha	Standard Deviation	Status
X1	0.894	0.892	Reliable
X2	0.898	0.910	Reliable
Y	0.816	0.832	Reliable

Multiple Regression Analysis Result

Table 4 presents information on multiple regression analysis results, along with the explanation.

Table 4: Multiple Regression Analysis Result

Model	Unstandardized Coefficients B
(Constant)	7.707
Panic Buying (X1)	0.191
Service Convenience (X2)	0.541

$Y = 7.707 + 0.191\ X\_1\ +\ 0.541\ 〖X〗\_2 + e$ ....(1)

The explanation of this equation is:

1. Constant (a) of 7.707 shows the purchase decision value. This means that if all are independent. If the variable is equal to zero (0), the purchase decision (Y) value is predicted to be 7.707.
2. The coefficient value of 0.191 means that if there is an increase in one unit of panic buying (X1), the purchase decision (Y) will increase by 0.191, assuming other variables are constant.
3. The coefficient value of 0.541 means that if there is an increase of one unit in service convenience (X2), then purchase decision (Y) will increase by 0.541, assuming other variables are constant.

F-Test Result ANOVA

Table 5 shows that the F-value is 50.177 with a significance level of 0.000 (less than 5%). So it can be concluded that H1 and H2 are accepted, which means that simultaneously there is an effect of panic buying and service convenience on the purchase decision.

Table 5: F-Test Result ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1548.163	2	774.082	50.177	.000[b]
	Residual	1249.587	81	15.427		
	Total	2797.750	83			
a. Dependent Variable: Total_Y						
b. Predictors: (Constant), Total_X2, Total_X1						

T-Test Result Coefficients

Table 6 presents the information on the T-Test result Coefficients, following the explanation.

Table 6: T-Test Result Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	**Std. Error**	**Beta**			**Tolerance**	**VIF**
1	(Constant)	7.707	3.130		2.462	.016		
	Total_X1	.191	.050	.304	3.814	.000	.870	1.149
	Total_X2	.541	.074	.578	7.267	.000	.870	1.149

a. Dependent Variable: Total_Y

Based on Table 6, by observing the rows, columns t and sig can be explained as follows:

1. The effect of panic buying variables on purchase decision Variable panic buying (X1) has a positive and significant effect on consumer purchasing decisions in modern markets in the atmosphere of the Covid-19 pandemic. This can be seen from the significance of the panic buying variable of 0.000, where < 0.05. Furthermore, the t-table value= t (α/2;n-k-1 = t (0,05/2;84-2-1) = (0.025;81) = 1.98969. It means that the value of t is greater than the t-table (3.814 > 1.98969), then H1 is supported. So that panic buying has a positive effect on consumer purchasing decisions in modern markets in the atmosphere of the Covid-19 pandemic.

2. Effect of service convenience variables on purchase decision Service convenience (X2) has a positive and significant effect on consumer purchasing decisions in modern markets in the atmosphere of the Covid-19 pandemic. This can be seen from the significance of the service convenience variable of 0.000, where < 0.05. Furthermore, the t-table value= t (α/2;n-k-1 = t (0.05/2;84-2-1) = (0.025;81) = 1.98969. It means that the value of t is greater than the t-table (7.268 > 1.98969), then H2 is supported. So that service convenience has a positive effect on consumer purchasing decisions in modern markets in the atmosphere of the Covid-19 pandemic.

Discussion

After collecting and analyzing data consecutively, the researchers concluded that all existing H1 and H2 were valid and showed a significant positive relationship between panic buying, service convenience, and consumer purchasing decision behavior. The results of this study are the same as the research conducted by András & Tamás (2020) and Ho et al. (2020), who stated that panic buying occurred due to the Covid-19 pandemic encouraged people to make purchases to meet their daily needs. Furthermore, the results noted that the modern market must understand the community's situation and conditions and keep up with the latest crisis surrounding customers' needs, as is the case in this study, with the current covid-19 pandemic causing public panic about the little necessities of life, especially from March to June 2020 which causes consumer purchases of necessities of life to increase due to the discomfort caused by the Covid-19 pandemic. Consumers' convenience from service also impacts consumer purchasing decisions, especially in the current Covid-19 pandemic, where basic needs are needed, especially in modern markets where consumers are the primary choice a place to go to make purchases. The services provided are exemplary, speed in serving, product availability, warranty, product-related information is very needed by consumers, and creates its comfort in services that consumers feel, such as research conducted by Chang et al. (2010) and Benoit et al. (2017).

The findings in this research summarized that panic buying is part of consumer behavior caused by personal (psychological) and environmental factors that influence purchase decisions during the pandemic in the modern

market, such as anticipating price increases, anticipating shortages of staples, news related to the pandemic of covid-19, seeing other people making purchases, uncertainty about product availability, etc. and the convenience of services provided by the modern market have led to purchase decision behavior such as strategic modern market locations, competitive product prices, adequate operating hours, convenience in making transactions, clear product information, and so on.

Conclusion

Purchasing decisions are the part of consumer behavior where it will significantly affect the success rate of goods and services. Panic buying and service convenience have become significant concerns in terms of purchasing decisions, especially in the era of the Covid-19 pandemic nowadays. This study examined the effect of panic buying and service convenience on buying decisions. The results showed that panic buying and service convenience partially had a positive impact on purchasing decisions. Also, it was found that simultaneously panic buying and service convenience also had positive effects on purchasing decisions.

Limitations

This study focuses on panic buying and service convenience on consumer purchasing decisions during the Covid-19 pandemic. The respondents were 18-56 years old. The samples taken are only respondents who have made purchases in modern markets such as Indomaret, Alfamart, hypermart, etc., in Surabaya. This research was conducted because of the Covid-19 pandemic current situation. In the future, it is also expected to conduct research using other variables that connect to the phenomenon of Covid-19.

Conflicts of Interest: The authors declare no conflict of interest.

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Organizational-Based Self-Esteem and Organizational Identification as Predictors of Turnover Intention: Mediating Role of Organizational Trust

Tochukwu Matthew Oguegbe[1], Henry Samuel Edosomwan[2*]

[1, 2]Department of Psychology, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria
* Corresponding author: edosomwanofficial@gmail.com

Abstract

Purpose- This study aimed to examine the predictive role of organizational-based self-esteem and organizational identification on turnover intention while also studying the mediating effect of organizational trust among employees across five organizations.

Design/Methodology- This study utilized the cross-sectional research design and quantitative approach for data collection. The study sample comprises 131 employees drawn from five organizations with a mean age of 33.15 years (SD, 7.97). Standardized instruments (questionnaires) were used for data collection. The IBM-SPSS Statistics and Hayes PROCESS macro (model 4) was used for testing the hypotheses and conducting the mediational analysis.

Findings- The results of the study revealed a significant negative relationship between organizational-based self-esteem and turnover intention (β= -.33, p < .01), and also a significant negative relationship between organizational identification and turnover intention (β=-.29, p < .01). Organizational trust was also found to mediate both relationships.

Practical Implications- The results of this study highlight the importance of organizational-based self-esteem, organizational identification and trust in reducing turnover intention. The study recommends that to keep employees in the organization, human resources management (HRM) needs to foster trust, build practice that will promote identification and attachment, and enhance the relationship between the organization and employees.

Introduction

Organizational-based self-esteem, organizational identification, turnover intention, and trust in the organization are recurring topics in management literature. It is well established that the human capital in the organization remains an essential factor to consider in achieving organizational success, which is the goal of organizations worldwide (Valenti & Horner, 2019). Retaining the best talents in the organization has been one of the major ways of attaining this success. Organizations worldwide are designing retention strategies to help them optimize the human resource at their disposal (Kaur & Mohindru, 2013). Irrespective of this, some employees still consider leaving the organization, which can be attributed to various factors (including individual and organizational). Turnover is a very crucial issue for all organizations. Turnover is defined as the degree to which existing employees leave and new employees come into the organization (Kaur & Mohindru, 2013). Turnover is categorized into a voluntary and involuntary turnover. It is voluntary when employees leave the organization out of their choice or freewill.

On the other hand, it is involuntary when the organization decides to terminate the employment relationship or do away with an employee. Voluntary turnover, which is the main focus of this study, has dire consequences for the organization. Turnover intention is the likelihood that an employee will leave the organization within a given time (Cotton & Tuttle, 1986; Seo & Ko, 2002).

Literature on the likely individual and organizational factors that can predict employee turnover intention is complex and ongoing. In this study, organizational-based self-esteem and organizational identification are utilized as predictors of turnover intention while also studying for the mediating effect of organizational trust. Although few studies have been carried out on the relationship between the independent variables (Organizational-based self-esteem and organizational identification) and turnover intention, the current study is necessitated by some gap in the literature. First, the literature is highly dominated by studies conducted in Europe and America (e.g., Bowden, 2002; Cole & Bruch, 2006; Giritli, 2015; Phillips & Hall, 2001; Van Dick et al., 2004). Therefore, the current study presents research from a different cultural setting, which may have an impact on the instruments for data collection, conceptualization, and the possible relationship between the independent and dependent variables (McArthur, 2007). Second, studies on the relationship between turnover intention and other organizational variables carriedout in the present research location (Nigeria) have primarily focused on private-sector employees (e.g., Chiedu, Long, & Ashar, 2017; Mbah & Ikemefuna, 2012; Umar & Ringim, 2015) with little attention given to the public sector employees. The current study utilized employees in public and private sector organizations offering the research findings a broader application and strength of generalization. Lastly, it is well established in organizational research that another variable can mediate the relationship between two variables. The current study also included a possible mediating variable (organizational trust) better to understand the relationship between independent and turnover intention. Theoretical evidence (social exchange theory; Blau, 1964) supported the inclusion of organizational trust as a mediator in this study. The importance of establishing trust in the employee-employer relationship cannot be undermined. Trust between individuals and groups within the organization has been recognized as a very important tool in achieving long-term stability in the organization and dealing with the welfare of its members (Cook & Wall, 1980).

Because of the above-stated problem and research gap, the study aims to examine the predictive role of organizational-based self-esteem and organizational identification on turnover intention and investigate the mediating role of organizational trust on the observed relationship predictors and the criterion variable.

Conceptual Review

Organizational-Based Self-Esteem

The importance of employee workplace behavior cannot be overemphasized. Organizational-based self-esteem is one of the behaviors that are likely to have an impact on other organizational processes. Organizational-based self-esteem is defined as the extent to which employees believe they are essential, meaningful, effectual, and worthwhile within the organization they work for (Pierce et al., 1989). This construct has been given much attention in behavioral research (e.g., Chan et al., 2013; Gardner & Pierce, 2011; Kark & Shamir, 2002). Organizational-based self-esteem is an employee's overall evaluation of his/her capability, worthiness, and importance as a member within the organizational setting (Pierce & Gardner, 2004). This worth that employees build is based on the history of interpersonal and systemic experiences (Pierce et al., 1989).

Organizational Identification

Several definitions have been proposed for organizational identification. Organizational identification is defined as the employee's perception of oneness with and belongingness to the organization in which they are a member (Ashforth & Mael, 1989). The congruence of individual and organizational values is essential in identifying with an organization (Pratt, 1998; Stengel, 1987). Organizational identification can also refer to how an employee integrates the self-perception as a member of a specific organization into a general self-definition (Dutton et al., 1994; Rousseau, 1998). Organizational identification consists of oneness with the organization, showing support for the organizational processes, and having common characteristics with other members of the organization (Patchen, 1970). Organizational identification indicates the level of psychological attachment and feeling of belongingness an employee has for being a member of an organization. Social identity theory- which is the most prevalent theory used in explaining organizational identification, is of the notion that people from a perception of the self through interaction, affiliation, and connection to specific social groups, such identification helps in fostering and protecting self-identity (Carmeli, Gilat & Waldman, 2007).

Turnover Intention

Turnover intention is the individual's intention to willingly leave the organization or end the employment relationship (Seo & Ko, 2002). It is an employee's perception of the possibility of leaving the organization he/she works for (Cotton & Tuttle, 1986). Turnover intention is a conscious process seen as a stage before the final decision to leave the organization. Many factors in the workplace interact before the employee makes the final decision to leave the organization. Turnover occurs in two ways: voluntary and involuntary turnover. Voluntary turnover occurs when an employee decides to terminate the employment relationship by leaving the organization. In contrast, involuntary turnover occurs when the organization decides to terminate the employment contract with the employee due to reasons including workplace misconduct (e.g., insubordination, dishonesty) and incompetence (e.g., poor job performance) in the workplace (Seo & Ko, 2002).This study is focused on the interactions of other workplace variables (organizational-based self-esteem, organizational identification, and organizational trust) on voluntary turnover intention.

Organizational Trust

Organizational trust is a type of institutional trust built mainly on the relationship between employees, supervisors, and the organization (Ashford, Lee, & Bobko, 1989). In an attempt to integrate all essential components of trust based on the different approaches used to investigate the concept in organizations, Mayer, Davis, and Schoorman (1995) defined organizational trust as the willingness of an employee to be susceptible to the actions of the organization based on the belief and expectation that the organization will carry-out specific step important to him/her, regardless of his/her ability to assert control or monitor the organization. According to Bhattacharya, Devinney, and Pillutla (1998), trust is an expectancy of positive outcomes that an individual

can get based on another party's expected action, which is characterized by uncertainty. This suggests that organizational trust is mainly dependent on interaction, vulnerability, anticipation, and expectation.

Several existing definitions of the concept of trust was merged by Whitener et al. (1998), and this led to three essential facets of trust: (a) trust in another party reflects an expectation that the other party will act benevolently; (b) neither party can force or control the other to fulfill the expectations involved, and (c) Some level of dependency is built on the other party such that the outcome of one party affects the actions of another. Organizational trust refers to the employees estimating and identifying with organizational policies and being willing to expose themselves to be hurt in a job situation (Robinson, 1996). In line with this, trust involves the willingness to take the risk and be vulnerable to another party, believing that the party will live up to its expectations (Lamsa & Pucetaite, 2006). Thus, organizational trust involves a set of beliefs and expectations as perceived by the employees that the actions of the organization will be beneficial to their long-term self-interest and goals, especially in situations in which the employees depend on the organization to make provisions for things that are significant to promoting employees' wellbeing and approach to work. The current study defines organizational trust as the total evaluation of the organization's trustworthiness as perceived by the employees, i.e., organizational trust is the employee feeling of confidence in the organizational processes, belief that the organization will perform actions that are rewarding and beneficial, or at least not detrimental to him or her (Tan & Tan, 2000).

Hypothesis Development

Organizational-Based Self-Esteem and Turnover Intention

The empirical literature has established that organizational-based self-esteem positively impacts other work-related behaviors that are significant to the success of an organization. For example, organizational-based self-esteem has been found to correlate positively with job and general workplace satisfaction (e.g., Pierce et al., 1989; Carson et al., 1998; Bowden, 2002; Gardner & Pierce, 2001; Van Dyne & Pierce, 2004), organizational identification (e.g., Bowden, 2002; Kark & Shamir, 2002), adaptation to organizational change (Staehle-Moody, 1998), facets of organizational citizenship behavior- altruism and compliance (Tang & Ibrahim, 1998), self-perceived employability (Sumanasiri, Ab Yajid & Khatibi, 2016) and organizational commitment (e.g., Pierce et al., 1989; Phillips & Hall, 2001; Tang, Singer & Roberts, 2000; Van Dyne & Pierce, 2004) indicating that employee with high organizational-based self-esteem is more committed to the organization. This suggests that organizational-based self-esteem has a positive impact on good workplace behaviors. Therefore, it should be able to reduce negative workplace behavior among employees in an organization.

Therefore it is not surprising that organizational-based self-esteem has an empirical link with employee turnover intention. Existing literature indicates that organizational-based self-esteem correlates negatively with turnover intentions (e.g., Bowden, 2002; Gardner & Pierce, 2001; Phillips & Hall, 2001). More recently, Hardaningtyas (2020) studied the mediating role of work engagement on the predictive relationship between personal resources (self-efficacy, organizational-based self-esteem, and optimism) and turnover intention and observed that personal resources (self-efficacy, organizational-based self-esteem, and optimism) have a positive effect on turnover intention and that work engagement mediated this relationship. The outcome of organizational-based self-esteem reduces turnover intentions. In congruence with the above review, it is hypothesized that:

Hypothesis One (H1): Organizational-based self-esteem (OBSE) has a negative predictive relationship with turnover intention.

Organizational Identification and Turnover Intention

Management literature has paid considerable attention to organizational identification and turnover intention across various work settings. The construct of Organizational identification can effectively influence an employee's decision to leave or remain in an organization. For instance, organizational identification was found

to have a significant adverse effect on turnover intention (e.g., Cole & Bruch, 2006; Giritli, 2015; Hameed, Arain, & Farooq, 2013; Kumar & Singh, 2012; Van Dick et al., 2004). Meta-analytical studies have also reported a strong negative correlation between organizational identification and turnover intention (e.g., Meyer et al., 2002; Riketta, 2005; Zang & Liu, 2016). Chi, Friedman, and Lo (2010) went further by investigating the downside of organizational identification during a period of collective shame and the impact on employee turnover intention. The result of their study indicated that employees who make solid internal attributions for the organization's wrong actions were more likely to feel collective shame and guilt-collective shame leads to an increase in turnover intention- therefore, more likely to leave the organization. This indicates that organizational identification may harm the organization during a period of organizational wrongdoing. Based on the review above, it is hypothesized that:

Hypothesis Two (H2): Organizational identification has a negative predictive relationship with turnover intention.

Organizational Trust as a Mediator

Over the years, management researchers have explored the predictive relationship between variables by utilizing mediation and moderation analysis. Evidence linking organizational trust to increase desirable workplace behaviors exists in the literature. For example, organizational trust is a critical factor in organizational effectiveness (Siebert et al., 2015), cooperative behavior (Gambetta, 1998), employee engagement (Ugwu et al., 2014), affective commitment (Xiong et al., 2016), organizational citizenship behavior (Chhetri, 2014) and job satisfaction (Aryee, Budhwar, & Chen, 2002). Organizational trust has also been found to reduce negative workplace behavior such as counterproductive work behavior (Ran & Wang, 2010), deviant organizational behavior (Akhigbe & Sunday, 2017; Baghini, Pourkiani, & Abbasi, 2014; Celik, Turunc, & Begenirbas, 2011) and turnover intention (Balkan, Serin, & Soran, 2014; Davies et al., 2000).

The ability of the organizational trust to reduce negative workplace behavior might indicate that it can mediate the role of organizational-based self-esteem and organizational identification on turnover intention. Literature on the mediating role of organizational trust between the independent variables (organizational-based self-esteem and organizational identification) and turnover intention is in shortage. Few studies on the mediating role of organizational trust on the relationship between other organizational variables exist. For example, organizational trust has been found to partially mediate the relationship between organizational justice and organizational commitment (Iqbal & Ahmad, 2016), perceived organizational support and constructive deviance (Kura, Shamsudin, & Chauhan, 2016), specific areas of work-life (workload, fairness, reward, and value), and emotional exhaustion (Bayhan, Metin, & Tayfur, 2016), psychological empowerment, job satisfaction and organizational commitment (Alajmi, 2016), distributive and procedural justice on turnover intention (Aryee, Budhwar, & Chen, 2002) and employee- organizational relationship and innovative work behavior (Yu et al., 2018). A study by Hameed, Arain, & Farooq (2013) on the mediating role of identity-based trust on the relationship between organizational identification and turnover intention indicated that trust partially mediated the negative relationship between the predictor and criterion variable.

Organization trust as a mediator between the independent variables (organizational-based self-esteem and organizational identification) and turnover intention can be explained by social exchange theory. Social exchange theory based on reciprocity (Blau, 1964) suggests that employees are likely to return good organizational good deeds through positive behavior in the workplace. Thus, according to Blau (1964), the relationship between individuals and their work environment is based on two forms of exchange: transactional (which involves the exchange of money and related resources) and socio-emotional exchange (which consists of the way organizational treats employees and employee trust for the organization). Utilizing the exchange relationship's socio-emotional aspect, when employees perceive the organization as trustworthy (having the confidence that the organization's actions will be beneficial), employees tend to reciprocate through positive

organization behavior such as deciding to remain a member of the organization. In sum, it is expected that organizational trust has a role in the relationship between the independent variables (organizational-based self-esteem and organizational identification) and turnover intention. Considering the review above, it is hypothesized that:

Hypothesis Three (H3): organizational trust mediates the negative relationship between (a) Organizational-based self-esteem (OBSE) and turnover intention, and (b) Organizational identification and turnover intention.

Based on the conceptual and empirical literature reviewed, the framework below has been designed for this study:
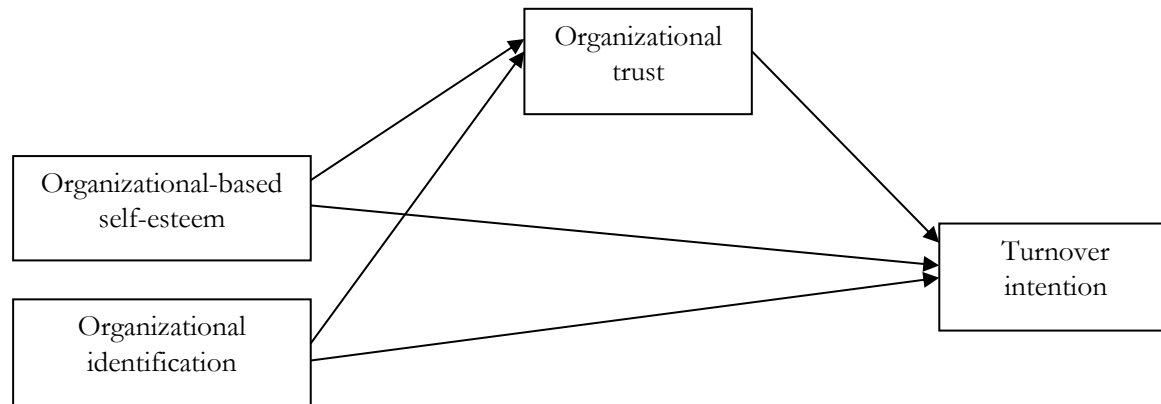

Fig. 1: Conceptual framework depicting the relationship between the variables.

Methodology

Sample

One hundred and thirty-one participants were sampled from five organizations in Lagos State, Nigeria. The participants' selected demographic characteristics represent some of the salient features used in categorizing employees in the workplace. According to the analysis of demographic characteristics, these features were well represented in the sample. The sample consists of 74(56.5%) males and 57(43.5%) females; 70(53.4%) unmarried and 61(46.6%) married; 64(48.9%) participants were from the privately-owned organization while 67(51.1%) participants were from government-owned organizations; 82 (62.6%) were junior staff while 49(37.4%) were senior staff in the various organizations. The age range of the respondents was between 20-56, with a mean of 33.15 years (SD, 7.97years; Range, 36). All the participants had a formal education with a minimum of O' Level certification which accounted for 15(11.5%). The majority city of the respondents, 102(77.9%), had a first-degree certification which gives validity to the use of report measures, accounted for the efficient response to the scale items, the questionnaires' high return retires. The inclusion criteria indicated that participants have spent between 3-27years in their respective organizations with a mean of 7.36 (SD, 5.24; Range, 24). A large proportion, consisting of 46 (35.1%) of the research participants, have spent at least three years in their respective organizations.

Procedure

The researchers sought the permission of the five organizations before the administration of the questionnaires. The questionnaires were administered to participants in their workplaces through the assistance of line managers, supervisors, and senior administrators. To effectively measure these behaviors in the organizations, an inclusion criterion was developed. Only employees who have spent at least three years in their respective

organizations were allowed to participate in the study. This is based on the assumption that three years is sufficient for an employee to develop specific behaviors towards the organization. Within this time frame, employees must have undergone different training and development programs, had various interactions with other employees in the organization (including staff at the human resource management level), and must have developed a unique attitude and perception of activities in the organization. A non-probability sampling (convenience sampling) technique was utilized in administering the questionnaires. It is a convenience sampling because employees who were available, easy to reach, and met the inclusion criteria was utilized for the study. One hundred and forty-five (145) questionnaires were distributed across all five organizations within four weeks. A total of 136 (93.80%) questionnaires were retrieved. The response rate was largely satisfactory. However, after sorting out the questionnaire, 131(90.34%) were used to analyze data.

Measures

Organizational-based self-esteem:

Organizational-based self-esteem was measured with a scale developed by Pierce et al. (1989). It is a 10-item scale measuring the degree to which employees believe they are worthwhile and valuable to the organization. A 5-point Likert-type scale (1 = strongly disagree and 5 = strongly agree) was adopted. Sample items for the scale include: "I am trusted in the organization I work for" and "I can make a difference in the organization I work for." The instrument's internal consistency (Cronbach's Alpha), as indicated by Pierce et al. (1989) with seven different samples, was between .89 and .96 with an average value of .91.

Organizational Identification:

This was measured with the organizational identification scale developed by Mael and Ashforth (1992). It is a 6-item scale measuring the degree to which employees identify with their organization. A 5-point Likert-type scale (1 = strongly disagree and 5 = strongly agree) was also adopted. Sample items for the scale include: "If a story in the media criticizes my organization, I would feel embarrassed" and "I am very interested in what others think about the organization I work for." A Cronbach's alpha of .87 was reported for the 6-item scale (Mael & Ashforth, 1992).

Turnover Intention:

The turnover intention was measured with a 4-item employee turnover intention scale developed by Kim et al. (1996). The response was on a 5-point Likert format (1 = strongly disagree and 5 = strongly agree). Two items were negatively worded. These negatively worded items were reversed coded. Sample items from the scale include: "I plan to leave my current organization as soon as possible" and "under no circumstances will I voluntarily leave my organization." A Cronbach's alpha of .85 was reported for the 4-item scale (Kim et al., 1996).

Organizational Trust:

The organizational trust scale developed by Robinson (1996) was utilized for this study. The organizational trust scale is a 7-item scale that measures employee feeling of confidence in the organizational processes and belief that the organization will perform actions that are rewarding and beneficial to them. A 5-point Likert type scale (1 = strongly disagree and 5 = strongly agree) was utilized as indicated by the scale developer. Items 1, 2, 4, and 6 are positively worded, whereas items 3, 5, and 7 are negatively worded and reversed coded. Examples of some of the items are: "I believe my employee has high integrity" and "my employee is not always honest and faithful." Cronbach's alpha was reported across two surveys carried out within 30 months with the same scale. Survey one indicated a Cronbach's alpha of .82, and survey two indicated a Cronbach's alpha of .87 (Robinson, 1996).

Design and Statistical Tool

This study adopted the cross-sectional research design. The cross-sectional research design is appropriate because the sample was drawn from all participating organizations, and data were collected from the sample at one point in time (Shaughnessery et al., 2003). Hypotheses 1 and 2 were tested with simple linear regression, while hypotheses 3a and 3b were tested with the mediational analysis using PROCESS macro-a modeling tool designed for IBM-SPSS (Hayes, 2013). In establishing for a mediational effect using PROCESS macro, there has to be no absolute zero in the range between the boot lower limit and the boot upper limit confidence interval in the indirect effect, i.e., if zero is not included in the interval, mediation has been established (Hayes, 2013). All the conditions necessary for establishing mediation were strictly observed. For instance, the likert scale was used to establish interval scaling, while the scatter plot derived from the data showed a linear relationship between the variables in the study. IBM-SPSS Statistics version 24 and Hayes PROCESS macro (model 4) were utilized for the data analysis.

Common Method Variance

Common method variance is one of the shortcomings of a questionnaire-based study. To control for common method variance, the researcher employed some of the methods suggested in the literature during the design of the study. To control for respondents' misinterpretation of the scale items and random responses, the wording of the questionnaire was clear, concise, and easy for the respondents to understand. The cover later guaranteed the respondents' anonymity and stated that there are no correct or incorrect responses to help reduce the socially desirable responses. These methods were applied to increase respondents' honesty (Podsakoff et al., 2003; Steenkamp, de Jong & Baumgartner, 2010; MacKenzie & Podsakoff, 2012).

Results

Reliability and Validity

The Cronbach's alpha for all the scales is shown in table 1. The four scales utilized for collecting data were tested for reliability and validity. The internal consistency of the scales was achieved through Cronbach alpha. Cronbach alpha value of .87 was obtained for organizational-based self-esteem, .86 for organizational identification, .77 for turnover intention, and .88 for organizational trust. The Cronbach alpha values were satisfactory and indicated that the scales have high internal consistency. An internal consistency coefficient (Cronbach's alpha) of .70 or above is primarily considered satisfactory (Feldt & Kim, 2008; Howitt & Cramer, 2011). Content validity was achieved by adopting existing scales that have been used overtime and proven to be valid in other studies. The scales must have undergone the basic developmental stages of content validity as proposed by Lynn (1986).

Table 1: Reliability analyses of the variables

Variables	Number of Items	Cronbach's Alpha
Organizational-based self-esteem	10	.87
Organizational identification	6	.86
Turnover intention	4	.77
Organizational trust	7	.88

Test for normality using skewness and kurtosis, as shown in table 2 indicates that the values were within the normal range (-3 to +3). This is an indication that the data is normally distributed (Gbasemi & Zahediaal, 2012).

Table 2: Test of normality using skewness and kurtosis

	Skewness	$SE_{skewness}$	$Z_{skewness}$	Kurtosis	$SE_{kurtosis}$	$Z_{kurtosis}$
OBSE	-.48	.21	-2.28	-.42	.42	-1
Org Identification	-.37	.21	-1.76	-.26	.42	-.61
Turnover Intention	.28	.21	1.33	-.20	.42	-.48
Org Trust	.31	.21	1.47	-.04	.42	-.01

Note: $SE_{skewness}$= standard error of skewness, $SE_{kurtosis}$= standard error of Kurtosis, $Z_{skewness}$= z-score for skewness, $Z_{kurtosis}$ = z-score for kurtosis, OBSE= Organizational-based self-esteem, Org Identification= organizational identification, Org Trust= organizational trust.

The Durbin-Watson test was within the acceptable range. It ranged from 1.78-1.87 and was acceptable concerning autocorrelation. The tolerance statistics were above .02, while the variance inflation factors (VIFs) were below ten, indicating an absence of multicollinearity (Field, 2013). Table 3 shows the mean, standard deviation, and correlation coefficient of the variables in the study. The table indicates that all the relationships are significant at p<0.01. The highest correlation coefficient was between organizational trust and organizational-based self-esteem at p<0.01. The observed Correlation coefficient was modestly indicating an absence of multicollinearity.

Table 3: Mean, standard deviation, and the correlation matrix on the variables

	Variables	$\bar{x}$	SD	1	2	3
1	Organizational- based self-esteem	4.38	.47			
2	Organizationalidentification	4.27	.67	.50**		
3	Turnover intention	2.43	.78	-.33**	-.29**	
4	Organizationaltrust	3.90	.64	.59**	.57**	-.57**

**p < 0.01 level (two-tailed).

Hypothesis Testing

The hypotheses were tested with simple regression analysis, while the mediational analysis was carried out using Hayes PROCESS macro (Hayes, 2013). Conditions necessary for regression and mediational analysis were adhered to. Table 4 shows a simple linear regression analysis of organizational-based self-esteem and organizational identification on turnover intention. As indicated in the table, the relationship between organizational-based self-esteem and turnover intention was negative and significant (β= -.33, p < 0.01). The test for analysis of variance also indicated that the simple regression analysis was significant (F= (1; 130) =15.86, p < 0.01) in predicting turnover intention. The R^2 statistics indicated that organizational-based self-esteem accounted for an 11% variance in turnover intention. Based on Cohen's (1988) criterion, the R^2 reflects a medium effect size. The B =-.55 indicates that for every one-unit increase in organizational-based self-esteem, turnover intention reduces by 0.55. The table also indicated a significant negative relationship between organizational identification and turnover intention (β=-.29, p < 0.01). Analysis of variance test also showed a significant relationship (F= (1; 130) =11.55, p < 0.01) in predicting turnover intention. The R^2 statistics indicated that organizational identification accounted for an 8% variance in turnover intention. Based on Cohen's (1988) criterion, the R^2 reflects a medium effect size. The B =-.33 indicates that for every one-unit increase in organizational-based self-esteem, turnover intention reduces by 0.33.

Table 4: Simple linear regression analysis of Organizational-based self-esteem and organizational identification on turnover intention

		Organizational-based self-esteem	Organizational identification
Turnover intention	*B*	-.55	-.33
	SE	.14	.10
	β	-.33**	-.29**
	t	-3.90	-.3.40
Watson	*Durbin-*	1.78	1.87
	95% CI	(-.82, -.28)	(-.53, -.14)
		F(1; 130) =15.86, R=.33, R^2=.11, p<0.01	F (1; 130) =11.55, R=.29, R^2=.08, p<0.01

**p < 0.01 level (two-tailed).

Table 5 below shows the indirect effect of organizational-based self-esteem on turnover intention through its effect on organizational trust. Since absolute zero was not indicated in the range between the boot LLCI and boot ULCI indirect effect (boot LLCI=-.85, boot ULCI=-.32) mediation was established. The results indicated that organizational trust mediated the relationship between organizational-based self-esteem and turnover intention.

Table 5: Indirect effect of organizational trust on paths from organizational-based self-esteem to turnover intention

Mediator	Effect	Boot standard Error	Boot Confidence Interval	
			BLLCI	*BULCI*
Organizational trust	-.57	.13	-.85	-.32

Note: BLLCI = Boot Lower Limit Confidence Interval, BULCI = Boot Upper Limit Confidence Interval

Table 6 below shows the indirect effect of organizational identification on turnover intention through its effect on organizational trust. Since absolute zero was not included in the boot LLCI and boot ULCI indirect effect (boot LLCI=-.59, boot ULCI=-.24), mediation was established. The results indicated that organizational trust mediated the relationship between organizational identification and turnover intention.

Table 6: Indirect effect of organizational trust on paths from organizational identification to turnover intention

Mediator	Effect	Boot standard Error	Boot confidence interval	
			BLLCI	*BULCI*
Organizational trust	-.40	.09	-.59	-.24

Note: BLLCI = Boot Lower Limit Confidence Interval, BULCI = Boot Upper Limit Confidence Interval

Discussion

The study was carried out to examine the role of organizational-based self-esteem (OBSE) and organizational identification on employee turnover intention and the mediating effect of organizational trust in the relationships. The model that organizational-based self-esteem negatively and significantly predicts turnover intention was good and offered support for hypothesis 1. This result is consistent with the extant literature (e.g., Bowden, 2002; Gardner & Pierce, 2001; Phillips & Hall, 2001), indicating that as organizational-based self-esteem increases, turnover intention tends to decrease in the organization. The model that organizational

identification negatively and significantly predicts turnover intention was also supported in this study, which supports hypothesis 2. This finding is congruent with the extant literature (e.g., Cole & Bruch, 2006; Hameed, Arain, & Farooq, 2013; Giritli, 2015; Kumar & Singh, 2012; Van Dick et al., 2004; Riketta, 2005; Zang & Liu, 2016) indicating that when employees identify with the organization, the chances that they will leave the organizational is reduced significantly.

The Mediational analysis established that organizational trust mediated the relationship between organizational-based self-esteem and turnover intention as the indirect effect measured through PROCESS macro (Hayes, 2013) had no absolute zero in the range between the boot LLCI and boot ULCI giving support for hypothesis 3a. The employee's feeling of confidence in the organizational processes and belief that the organization will perform rewarding and beneficial actions play an important role in an employee's decision to leave or stay with the organization. Therefore, organizational trust and organizational-based self-esteem account for the observed reduction in employee turnover intention in this study. Lastly, the hypothesis that organizational trust will mediate the relationship between organizational identification and turnover intention was also supported (hypothesis 3b). The mediational analysis measured through PROCESS macro (Hayes, 2013) showed no absolute zero in the range between the boot LLCI and boot ULCI, indicating that mediation exists. Therefore, the relationship between organizational identification and turnover intention was mediated by Organizational trust. The results of both mediational analyses (organizational trust on hypothesis 1 and hypothesis 2) were consistent with the social exchange theory (Blau, 1964), which is built on the notion of reciprocity. Employees are likely to return good organizational deeds through positive behavior in the workplace. When trust is established between the organization and the employees, employees are likely to stay with the organization.

Practical Implications

As the extant literature and this study indicated, organizational-based self-esteem, organizational identification, and organizational trust are of great importance to employee turnover in the organization. Therefore, these factors have implications for management. For management to keep employees in the organization, some practices that can help build employees' esteem in the organization, identification, and trust need to be established and executed by human resources management. Some of these practices may include consistent communication with employees, being honest and truthful regarding what happens within the organization (e.g., appraising employees for promotion), treating employees in consistent and predictable manner, promoting wellbeing, etc.

Limitations and Suggestions for Future Research

Although the purpose for which the research was carried has been achieved, it is essential to point out the critical limitation that is likely to affect the interpretation of the research findings. The first limitation is the use of a cross-sectional research design. Since the study uses the cross-sectional research design, it wasn't easy to establish the cause-effect relationship. Further studies in this area should use longitudinal or field experimentation to establish cause-effect relationships among the study variables. Another major limitation of the study is the convenience sampling technique utilized in selecting participants. Further studies should use a probability sampling method.

Also, the self-report measure was the only research tool utilized for gathering data from the participants. Several steps were taken to help reduce method bias during the design of the study. Still, some social desirability factors remain since it is challenging to control in a survey. A possible suggestion for future studies would be to include items in the questionnaire that can help identify participants with these characteristics and exclude their responses from the final data used for analysis.

Furthermore, public and private organizations were primarily represented in the sample. Still, the number of organizations utilized in the study affected the sample size, which may likely affect the generalization of the results. Future studies should use more organizations from public and private sectors and larger sample sizes to enhance generalizability, one of the bedrock of science.

Conclusion

Based on the findings in this study, a few conclusions can be made. From the results indicated in this study, organizational-based self-esteem plays an essential role in an employee's decision to leave or stay with the organization. The same was also observed for organizational identification and the determination of employees to go or stay with the organization. The effect size for both relationships was meaningful. Organizational trust also mediated the observed relationship between the predictor and criterion variables. These findings led to the following conclusion: to keep employees in the organization, human resources management (HRM) needs to foster trust, build a practice that will promote identification and attachment, and enhance the organization-employee relationship.

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